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NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/1
NATIONAL DAM SAFETY PROGRAM. CLARK'S CREEK WATERSHED PROJECT SI-
SEP 80 G KOCH

DACW51-79-C-0001

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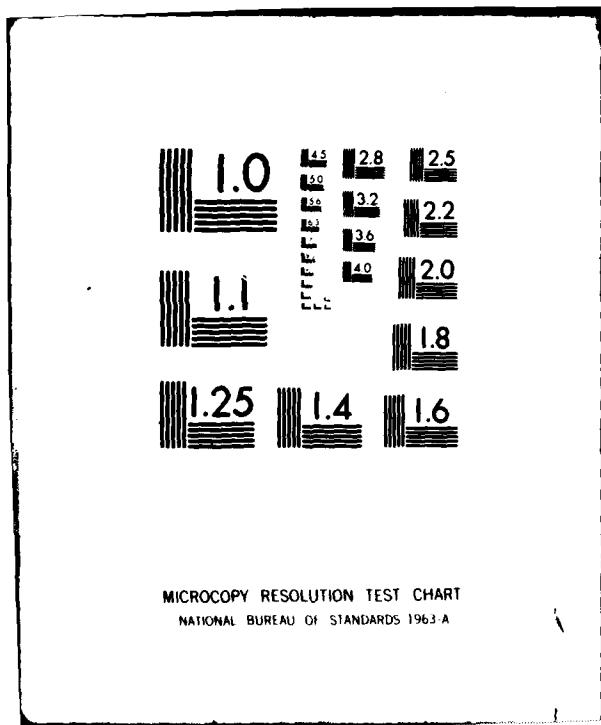
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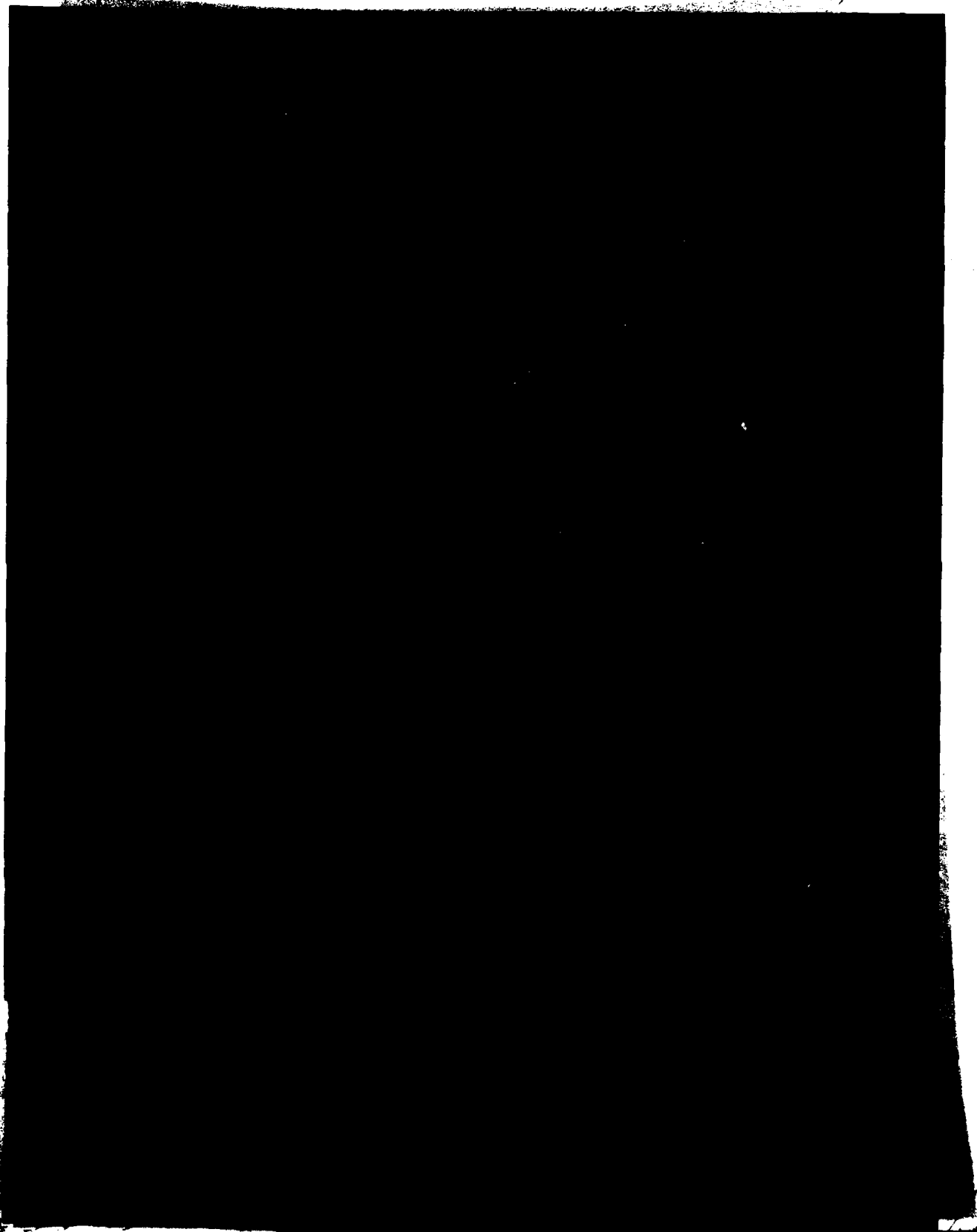
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dam Safety National Dam Safety Program Visual Inspection Hydrology, Structural Stability Clark's Creek Chenango County Susquehanna River		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number). This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. The examination of documents and visual inspection of the Clark's Creek Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.		

The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are cutting brush and trees which are growing near the riser and in the vicinity of the plunge pool and investigating the wet area in the bottom of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.



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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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6 PHASE I INSPECTION REPORT
 NATIONAL DAM SAFETY PROGRAM
 CLARK'S CREEK WATERSHED PROJECT SITE I (I.D. # NY-718
 (1068-4076) SUSQUEHANNA RIVER BASIN)
 CHENANGO COUNTY, New York.
 Phase I Inspection Report
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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Clark's Creek Watershed Project Site 1
I.D. No. NY-718

State Located: New York

County Located: Chenango

Watershed: Susquehanna River Basin


Date of Inspection: July 31, 1980

ASSESSMENT

The examination of documents and visual inspection of the Clark's Creek Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.

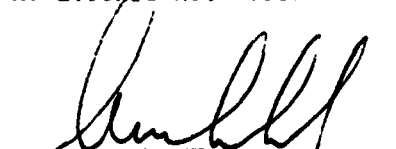
The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are cutting brush and trees which are growing near the riser and in the vicinity of the plunge pool and investigating the wet area in the bottom of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.



George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:


Colonel W.M. Smith Jr.
New York District Engineer

Date:





OVERVIEW
CLARK'S CREEK WATERSHED PROJECT
SITE 1

I.D. No. NY-718

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
CLARK'S CREEK WATERSHED PROJECT
SITE I
I.D. No. NY-718
(#106B-4076)
SUSQUEHANNA RIVER BASIN
CHENANGO COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

→ The Clark's Creek Watershed Project Site I dam consists of an earth dam with a service spillway pipe passing through the embankment and an excavated auxiliary spillway passing around the eastern end of the dam.

The dam consists of a compacted earth embankment which is 46 feet high, has a crest length of 1250 feet and a crest width of 16 feet. The upstream slope is 1 vertical on 3 horizontal with a 10 foot wide berm near the base of the slope. The downstream slope is 1 vertical on 2.5 horizontal. The crest and exposed slopes are covered with grass and crownvetch. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils. → E-6 p. 142

The service spillway consists of a two-stage rectangular concrete drop inlet structure, a 30 inch diameter reinforced concrete pipe with anti-seepage collars and a riprapped plunge pool. A reservoir drain consisting of a 12 inch diameter cast iron pipe extends from the upstream toe of the embankment to the base of the spillway riser. A vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The auxiliary spillway is an earth cut with a bottom width of 200 feet.

An internal drainage system consisting of a gravel and stone filter is located at the base of the embankment near the downstream toe. Seepage is conducted through this drain to beyond the toe of the embankment via twin 6 inch diameter asbestos-cement pipes.

b. Location

The Clark's Creek Watershed Project Site I Dam is located off McCall Road

in the Town of Oxford. The structure is approximately one mile northwest of the Village of Oxford.

c. Size Classification

The dam is 46 feet high and has a maximum storage capacity of 200 acre feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams".

d. Hazard Classification

This dam is classified as "high" hazard due to the presence of a number of homes in the Village of Oxford located downstream of the dam.

e. Ownership

The dam is owned by Chenango County, New York and maintained by the Village of Oxford. The contracting officer is Mr. Phillip Cummings whose telephone number is (607)334-4632.

f. Purpose of Dam

The dam is a floodwater retarding structure.

g. Design and Construction History

The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). The SCS office at the Broome County Airport has a design folder containing hydrologic, hydraulic and structural design information. The dam was under construction from 1972-74 by the Jones and Mead Construction Company of Appalachin, New York.

h. Normal Operating Procedures

Normal flows are discharged through the service spillway. This structure has sufficient capacity to store and discharge a 100 year flood without discharge occurring in the auxiliary spillway. For storms in excess of the 100 year flood, discharge through the auxiliary spillway can be expected.

1.3 PERTINENT DATA

<u>a. Drainage Area (acres)</u>	536
<u>b. Discharge at Dam (cfs)</u>	
Service Spillway at maximum high water	160
Service Spillway at auxiliary spillway crest elev.	91
Auxiliary Spillway at maximum high water	4,966
Reservoir drain at service spillway crest elev.	21
<u>c. Elevation (USGS Datum)</u>	
Top of Dam	1361.6
Auxiliary Spillway Crest	1357.2
Service Spillway Crest - High Stage	1355.9
- Low Stage	1335.1
Reservoir Drain (invert elevation)	1319.9
<u>d. Reservoir Surface Area (acres)</u>	
Top of Dam	17.6
Auxiliary Spillway Crest	13.3
Service Spillway Crest	12.2

e. Storage Capacity (acre-feet)

Top of Dam	199.8
Auxiliary Spillway Crest	129.0
Service Spillway Crest	113.0

f. Dam

Embankment type - A compacted earth fill with a rock zone, a keyed earth cut-off trench, and a drain parallel to axis of dam.

Embankment length (ft)	1250
Slopes-Upstream	1 vertical on 3 horizontal
-Downstream	1 vertical on 2.5 horizontal
Crest Width (ft)	16

g. Service Spillway

Type: Two Stage, ungated, reinforced concrete drop inlet (2.5 x 7.5 ft), rising 39 feet above the invert of the 30 inch diameter concrete conduit; length of conduit 240 feet.

Weir length (ft)	15.0
------------------	------

h. Auxiliary Spillway

Type: An excavated trapezoidal channel.

Bottom Width (ft)	200
Side Slopes (V:H)	1:3
Exit Slope (ft/ft)	0.020

i. Reservoir Drain

Type: 12 inch diameter cast iron pipe

Control: Manually operated vertical slide gate mounted along the inside of the service spillway riser.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Clark's Creek Watershed Project Site I Dam is located in the glaciated portion of the Appalachian uplands (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the Middle and Upper Devonian Catskill Delta. The plateau surface is represented by flat-topped divides with drainage generally southwest toward the Susquehanna River system.

The present surficial deposits have resulted primarily from glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

A subsurface investigation program was conducted by SCS during the design process in 1971. This program consisted of 4 drill holes and 25 test pits at locations along the dam, auxiliary spillway, structural elements and borrow area. Applicable subsurface information has been included in Appendix F.

In general, the soils in the vicinity of the dam are of glacial till origin and consist of silty sand with some gravel. The soils encountered had slight permeability.

2.2 DESIGN RECORDS

The dam was designed by the Soil Conservation Service, who prepared a design report. A folder containing the design report and other design information was available at the SCS office at the Broome County Airport. Twenty-two drawings, several of which have been included in Appendix F, were prepared for the construction of this dam.

2.3 CONSTRUCTION RECORDS

Complete construction records are available from the SCS office at the Broome County Airport. As built plans have been included in Appendix F.

2.4 OPERATION RECORDS

Since the dam is an uncontrolled, floodwater retarding structure, no operating records are maintained regarding water levels. During periods of heavy rainfall, SCS personnel do monitor reservoir levels.

2.5 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from the Soil Conservation Service as well as the New York State Department of Environmental Conservation files. It appears to be adequate and reliable for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site I dam was conducted on July 31, 1980. The weather was clear and the temperature was in the seventies. The water surface at the time of the inspection was at the low stage orifice elevation on the principal spillway riser.

b. Embankment

No signs of distress were observed in the earth embankment and no evidence of seepage, misalignment, subsidence or surface cracking were noted on the embankment. The only deficiencies noted were of a minor nature. There was some brush growing near the toe of the upstream slope in the vicinity of the riser. There were several spots on the downstream slope where the grass was somewhat sparse.

An internal drainage system composed of 2-6 inch diameter pipes surrounded by "drain fill" material and extending parallel to the axis of the dam provides drainage at the base of the embankment. At the time of the inspection, both pipes were dry.

c. Service Spillway

The service spillway consists of a vertical drop inlet structure, a reinforced concrete pipe, a plunge pool at the outlet to the conduit, and an outlet channel. The height of the riser made it impossible to inspect the top or interior of the structure. All elements which were visible appeared to be in good condition. There was brush and small willow trees growing at the outlet to the plunge pool.

d. Auxiliary Spillway

The auxiliary spillway for this structure is located in an earth cut at the eastern end of the dam. The channel bottom has a good grass cover which had recently been mowed. A wet area extends along the upstream portion along eastern side of the spillway. This area is up to 25 feet wide and over 300 feet long. It is caused by water flowing from the outer cut slope which forms the spillway channel side.

e. Reservoir Drain

The 12 inch diameter reservoir drain and manually operated slide gate may be used to lower the reservoir. The drain was reported to be operational.

f. Reservoir

There were no signs of soil instability in the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection of this dam revealed the following deficiencies:

1. A small amount of brush growing near the riser on the lower portion of the upstream slope.
2. Brush and small trees growing immediately downstream of the plunge pool.
3. A wet area in the bottom of the auxiliary spillway channel.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is at the low stage elevation of the principal spillway riser. Downstream flows are limited by the flow into the principal spillway riser, except during periods of extremely heavy runoff when the auxiliary spillway is in service.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the Village of Oxford through an agreement with the owner, Chenango County. While there were some minor deficiencies noted, this dam was generally well maintained.

4.3 WARNING SYSTEM IN EFFECT

There is no warning system in effect.

4.4 EVALUATION

The operation and maintenance procedures for this dam are satisfactory.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the 536 acre watershed of the Site I dam was made using the USGS 7.5 minute quadrangle for Oxford, New York. The watershed consists of open grassed fields and woodlands. Relief in the drainage area ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program develops an inflow hydrograph using the "Snyder Synthetic Unit Hydrograph" method and then uses the "Modified Puls" flood routing procedure. The spillway design flood selected was the Probable Maximum Flood (PMF) in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The principal and auxiliary spillways are ungated structures. The capacities for both spillways were taken from the stage-discharge data included in the SCS design report.

The spillways have sufficient capacity for discharging the peak outflow from the PMF. For this storm, the peak inflow is 1,577 cfs and the peak outflow is 1,567 cfs. When the spillways are discharging the peak outflow the water surface will be 2.5 feet below the top of the dam. Further information concerning this analysis is included in Appendix C.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and auxiliary spillway is 16 acre-feet which is equivalent to a runoff depth of 0.4 inches over the drainage area. Surge storage capacity to the maximum high water elevation is an additional 71 acre feet, equivalent to a runoff depth over the drainage area of 1.6 inches. Total storage capacity of the dam is 200 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood occurred on February 24, 1975. The pool level at this time was reported to be about 12.3 feet above the principal spillway crest. The calculated discharge for this flood is as follows:

<u>Elevation (USGS)</u>	<u>Discharge (cfs)</u>
1374.4	17

5.6 OVERTOPPING POTENTIAL

Analysis indicates that the total discharge capacity is sufficient to prevent overtopping from the PMF.

5.7 EVALUATION

This dam has sufficient capability to impound and adequately discharge floodwaters expected to result from the PMF.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of distress were observed in connection with the earth embankment.

b. Design and Construction Data

Design data was obtained from the Soil Conservation office at the Broome County airport. Stability analyses were performed using a Swedish circle method of analysis. One undrained triaxial shear test and one direct shear test was performed on compacted soil samples from the proposed borrow area. These tests were used to select soil parameters for use in the analysis. Various conditions were analyzed in the stability analysis. The conditions applicable to the dam as it was constructed are as follows:

<u>CONDITION</u>	<u>MINIMUM FACTOR OF SAFETY</u>	
	<u>UPSTREAM SLOPE</u>	<u>DOWNSTREAM SLOPE</u>
Full Draw Down	1.57	-
Long Term Steady State Seepage	-	1.62

The calculated factors of safety for this dam are considered to be adequate.

c. Seismic Stability

No seismic stability analysis was performed for this structure.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Clark's Creek Project Site I dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be structurally stable and the spillways are capable of retarding and safely discharging floodwaters resulting from the Probable Maximum Flood (PMF).

b. Adequacy of Information

Information reviewed for Phase I inspection purposes is considered to be adequate.

c. Need for Additional Investigations

No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

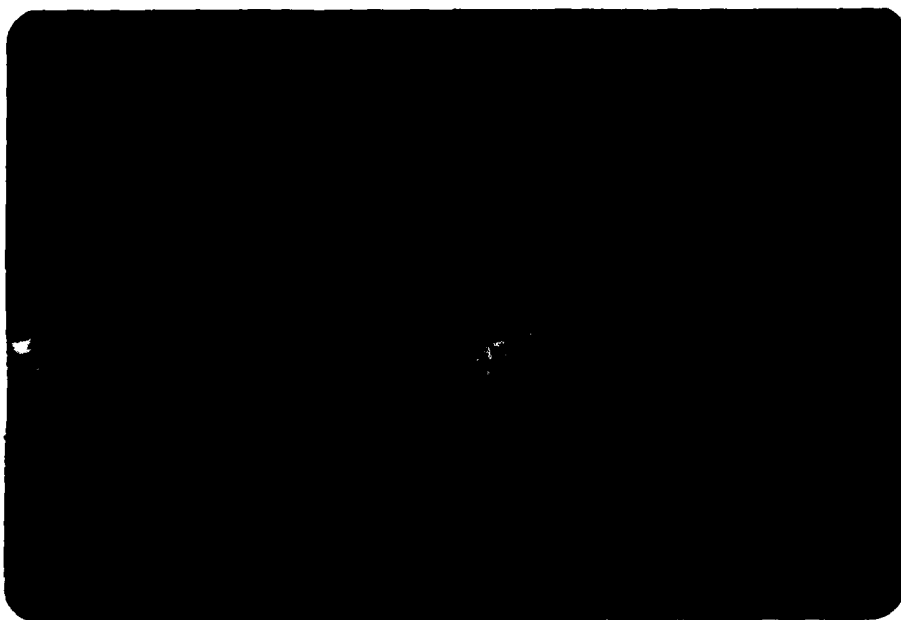
The following actions should be taken within 6 months of the date of final approval of this report:

- a. Cut the brush and small trees growing near the riser on the lower portion of the upstream slope as well as those in the vicinity of the plunge pool.
- b. Investigate the wet area in the bottom of the auxiliary spillway channel to determine whether remedial work is required to drain this area.
- c. Develop an emergency action plan for notification of downstream residents and the proper authorities in the event of large auxiliary spillway discharges.

APPENDIX A
PHOTOGRAPHS



Service Spillway Riser with Auxiliary Spillway
Channel at Left



Brush Growing on Slope Near the
Base of the Riser



Outlet to Principal Spillway Conduit and
Plunge Pool - Note Undesireable Growth through Rock



Plunge Pool and Downstream Channel
Note Small Tree Growing at Outlet to
Plunge Pool



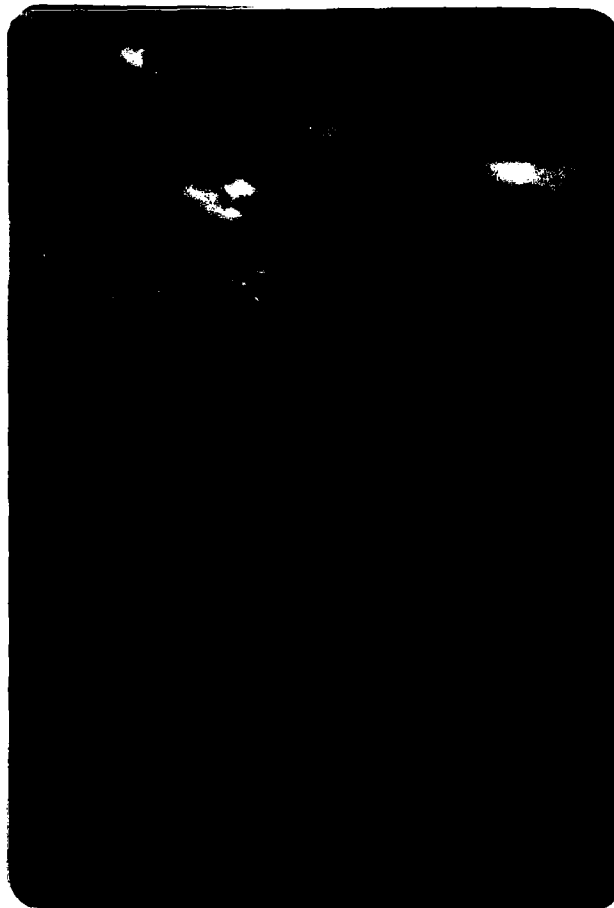
Entrance to Auxiliary Spillway Channel



Control Section of Auxiliary Spillway Channel



Wet Area on Cut Slope of Auxiliary Spillway



Wet Area at Base of Cut Slope on Auxiliary Spillway

APPENDIX B
VISUAL INSPECTION CHECKLIST

1

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam CLARK'S CREEK WATERSHED PROJECT SITE 1 DAM

Fed. I.D. # NY 718 DEC Dam No. #106B-4076

River Basin SUSQUEHANNA

Location: Town OXFORD County CHENANGO

Stream Name CLARK'S CREEK

Tributary of CHENANGO RIVER

Latitude (N) 42° 27.5' Longitude (W) 75° 36.1'

Type of Dam EARTH EMBANKMENT

Hazard Category C

Date(s) of Inspection 7/31/80

Weather Conditions SUNNY; CLEAR 75°

Reservoir Level at Time of Inspection AT LOW STAGE ORIFICE

b. Inspection Personnel W. LYNICK R. WARRENDER

c. Persons Contacted (Including Address & Phone No.) _____

GARY PAGE - SCS BROOME CO. AIRPORT OFFICE

607-773-2751

d. History:

Date Constructed 1974 Date(s) Reconstructed NONE

Designer SOIL CONSERVATION SERVICE

Constructed By JONES & MEAD CONSTRUCTION - APPALACHIN, N.Y.

Owner CHENANGO COUNTY - PHIL CUMMINGS @ NORWICH SWCD OFFICE
MAINTAINED BY VILLAGE OF OXFORD

2) Embankment

a. Characteristics

- (1) Embankment Material GLACIAL TILL
- (2) Cutoff Type COMPACTED EARTH
- (3) Impervious Core NONE
- (4) Internal Drainage System YES
- (5) Miscellaneous GRASS & CROWN VETCH

b. Crest

- (1) Vertical Alignment SATISFACTORY
- (2) Horizontal Alignment CURVILINEAR
- (3) Surface Cracks NONE
- (4) Miscellaneous

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1 ON 3
- (2) Undesirable Growth or Debris, Animal Burrows WELL MAINTAINED
MOWED GRASS - SOME BRUSH & TREES NEAR RISER AT BOTTOM
OF SLOPE
- (3) Sloughing, Subsidence or Depressions NONE

(4) Slope Protection NONE

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 ON 2.5

(2) Undesirable Growth or Debris, Animal Burrows NONE - GRASS
WAS SLIGHTLY SPARSE IN SPOTS

(3) Sloughing, Subsidence or Depressions NONE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) External Drainage System (Ditches, Trenches; Blanket) ALONG
ABUTMENT-EMBANKMENT CONTACT - NO SEEPAGE OR
WET AREAS

(7) Condition Around Outlet Structure SATISFACTORY

(8) Seepage Beyond Toe NONE NOTED

e. Abutments - Embankment Contact

DOWNSTREAM SLOPE - RIPRAP LINED - NO SEEPAGE OR
WET SPOTS

(1) Erosion at Contact NO

(2) Seepage Along Contact NONE

3) Drainage System

a. Description of System TWIN 6" ASBESTOS-CEMENT
PIPES WITH ANIMAL GUARDS ACROSS PIPE OUTLET

b. Condition of System APPEARED SATISFACTORY

c. Discharge from Drainage System NONE AT TIME OF INSPECTION

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs,
Piezometers, Etc.)

NONE

5) Reservoir

- a. Slopes RELATIVELY STEEP
- b. Sedimentation NONE APPARENT
- c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) VILLAGE OF OXFORD
- b. Seepage, Unusual Growth NONE
- c. Evidence of Movement Beyond Toe of Dam NONE
- d. Condition of Downstream Channel SOME BRUSH & SMALL TREES AT OUTLET OF PLUNGE POOL - BEYOND THAT TRAPEZOIDAL CHANNEL IS OKAY

7) Spillway(s) (Including Discharge Conveyance Channel)

- 2 STAGE RISER WITH LOW FLOW ORIFICE - AUXILIARY CHANNEL AT EAST END
- a. General SATISFACTORY
- b. Condition of Service Spillway NOT POSSIBLE TO INSPECT TOP OR INTERIOR OF RISER DUE TO HEIGHT OF RISER

c. Condition of Auxiliary Spillway RECENTLY MOWED
SATISFACTORY MAINTENANCE;
WET AREA WITH MINOR PONDING ALONG OUTSIDE BEND - SEEPAGE
OFF CUT SLOPE EXTENDS ABOUT 25' OUT FROM TOE OF CUT
AND FOR ABOUT 300 FT. - BEGINS UPSTREAM OF LEVEL SECTION &
EXTENDS TO END OF CHANNEL - FLOWING INTO RESERVOIR

d. Condition of Discharge Conveyance Channel _____
OKAY - SOME TREES SURROUND PLUNGE POOL

8) Reservoir Drain/Outlet

Type: Pipe ☒ Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other CAST IRON

Size: 12 Length 50'

Invert Elevations: Entrance 1319.9 Exit 1317.9

Physical Condition (Describe): _____ Unobservable ☒

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): REPORTED TO BE OPERABLE -
IS OPERATED ANNUALLY

9) Structural

- a. Concrete Surfaces PIPE - OKAY RISER - OKAY
- b. Structural Cracking NOT AT OUTLET
- c. Movement - Horizontal & Vertical Alignment (Settlement) NONE
- d. Junctions with Abutments or Embankments N/A
- e. Drains - Foundation, Joint, Face N/A
- f. Water Passages, Conduits, Sluices SATISFACTORY
- g. Seepage or Leakage NONE OBSERVED

- h. Joints - Construction, etc. N/A
- i. Foundation N/A
- j. Abutments N/A
- k. Control Gates RESERVOIR DRAIN - OPERATED ANNUALLY BUT NOT YET THIS YEAR
- l. Approach & Outlet Channels
- m. Energy Dissipators (Plunge Pool, etc.) SATISFACTORY - GRADED RIPRAP AROUND ENTIRE POOL & DOWNSTREAM CHANNEL SOME BRUSH & TREES IN VICINITY OF POOL
- n. Intake Structures
- o. Stability
- p. Miscellaneous

APPENDIX C
HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>1361.6</u>	<u>17.6</u>	<u>199.8</u>
2) Design High Water (Max. Design Pool)	<u> </u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u>1357.2</u>	<u>13.3</u>	<u>129.0</u>
4) Pool Level with Flashboards	<u> </u>	<u> </u>	<u> </u>
5) Service Spillway Crest	<u>1355.9</u>	<u>12.2</u>	<u>113.0</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u> </u>
2) Spillway @ Maximum High Water	<u>160.1</u>
3) Spillway @ Design High Water	<u> </u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>91.4</u>
5) Low Level Outlet	<u>20.5</u>
6) Total (of all facilities) @ Maximum High Water	<u>512.6</u>
7) Maximum Known Flood	<u> </u>
8) At Time of Inspection	<u> </u>

CREST:

ELEVATION: 1361.6Type: GRASSED EARTHWidth: 16 FTLength: 1250 FTSpillover GRASSED EARTH CHANNELLocation EASTERN END

SPILLWAY:

SERVICE

AUXILIARY

1355.9

Elevation

1357.2R/C DROP INLET

Type

GRASSED CHANNEL2.5 FT X 7.5 FT

Width

200 FT

Type of Control

✓

Uncontrolled

✓

Controlled:

Type

(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating service

Chute Length

Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

OPERATION OF RESERVOIR DRAIN

DRAINAGE AREA: 536 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FARM & FORESTS

Terrain - Relief: MODERATE

Surface - Soil: GLACIAL TILL

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: WEST END OF DAM - DIVERSION TO GET HIGHWAY
CULVERT RUNOFF AWAY FROM EMBANKMENT

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

Length of Shoreline (@ Spillway Crest) _____ (Miles)

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
CLARK'S CREEK WATERSHED PROJECT	1		
SUBJECT	COMPUTED BY	DATE	
HYDROLOGIC/HYDRAULIC COMPUTATIONS	RLW	7/22/80	

DRAINAGE AREA OF RESERVOIR - TAKEN FROM SCS PLANS

536 ACRES = .8460 mi

SNYDER SYNTHETIC UNIT HYDROGRAPH

$L = 1.63 \text{ mi.}$ $L_c = .72 \text{ mi.}$

$t_p = C_t (L + L_c)^3 = 2.0 [(1.63) + (.72)]^3 = 2.10$

$t_r = \frac{L}{S} = \frac{2.10}{5.5} = .38$ USE 20 MINUTE INCREMENTS

$t_{pr} = t_p + .25(t_p - t_r) = 2.10 + .25(2.10 - .38) = 2.09$

HR #33 PMA RAINFALL

ZONE 1 PMA RAIN = 2.0 IN

6 HR = 111% 24 HR = 132%

12 HR = 123% 48 HR = 143%

$TRSPF = 1 - \frac{.30 - .5}{.50 - .775} = .684$

BASE FLOW → USE 2 CFS

CLARK'S CREEK RC&D NY ESTD.

STAGE STORAGE CURVE

BY: J. DOWLING

13. 5. 51 11/1/51

160

150

140

130

120

110

100

90

STORAGE (AC. FT.)

1310

1330

1340

1350

1360

1370

ELEV. (FT.)

NO 10 X 10 TO THE INCH 48 0703
3 1/2 INCHES
RELIABLE & CORRECT CO.

50 7. 43 11/1/51
13. 5. 51 11/1/51

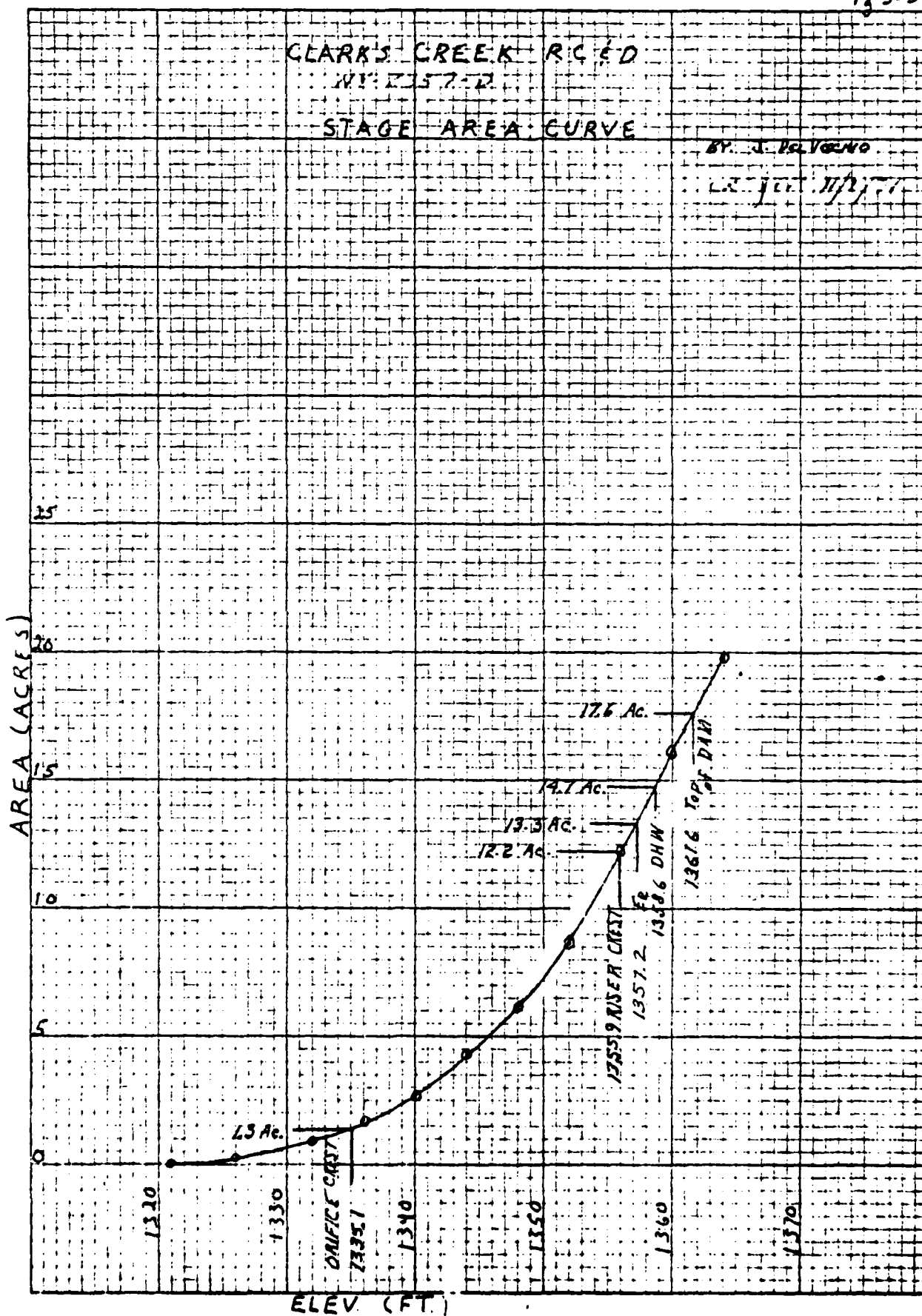
CLARK'S CREEK RCD

NOV 25 7-72

STAGE AREA CURVE

BY J. P. VOGNO

12 JUL 11/2/77



10X10 TO THE INCH 48 0703
2 1/2 IN. 10 INCHES
Knapen & Sons Co.

ELEV. (FT.)

PRINCIPAL SPILLWAY ROUTE

CLARK, CR & FAM 1 OPERATIONAL ROAD CLARK, YORK BY JEP NOV 3, 1971
 CR JHS NOV 4, 1971

24 HOUR
 CURV. NO. 100.00 RAINFALL 3.40, 1.40 ** CURVE NO. 100.00 RAINFALL 3.50, 1.50
 TO 0.90 LENGTH OF PIPE 144. MANNING'S "N" VALUE 0.012 DRAINAGE AREA 0.24

BASE FLOW IS 3.00 CFS (5.72 CFS).

120 STAGE WITH OPEN TOP.

LOW STAGE GREST FLOW. 1235.10 OPENING IS 1.00 X 1.00 FEET.

HIGH STAGE GREST FLOW. 1235.90 WIDTH 1.00

CONCRETE 17.15 IS 30. INCHES.

ELEVATION	STORAGE	CFS
1335.10	1.90	0.00
1339.25	1.28	9.20
1343.41	20.76	13.45
1347.57	49.32	19.05
1351.73	78.98	19.33
1355.89	120.99	21.68
1356.10	124.01	23.94
1356.30	126.04	25.65
1356.50	129.07	28.30
1356.69	132.50	30.30
1356.90	135.33	30.71
1357.10	138.16	31.43
1357.30	140.99	31.43
1357.50	143.82	32.02
1357.69	146.65	32.90
1357.89	149.48	34.09
1358.00	152.34	35.90
1361.00	197.07	119.13
1363.00	232.82	162.30
1365.00	268.57	175.40
1367.00	304.32	188.45
1369.00	340.07	171.45
1371.00	375.02	174.39
1373.00	411.57	177.26
1375.00	447.52	180.13
1377.00	483.07	182.96
1379.00	518.32	185.70

E. S. DESIGN AND F. DARD KLUTINGS.

CLARKS CREEK DAM 1 CHENANGO RCSD NEW YORK BY JAM 11-23-71 CK JEP

CURVE NO. 75. / TC 0.90 / STORM DURATION 6.00

EMER. SPW. RAINFALL 9.10 / FREEBOARD RAINFALL 23.00

CASE NO. 2. DRAINAGE AREA 0.84 / EMER. SPW. CREST 1357.2

801 120. 11 500 802 200. / L2 500 803 250. / L3 500.

ELEVATION	STORAGE	CFS	CFS	CFS
1335.60	8.	1.	1.	1.
1336.00	8.	2.	2.	2.
1340.00	16.	10.	10.	10.
1344.00	30.	13.	13.	13.
1348.00	51.	16.	16.	16.
1352.00	80.	19.	19.	19.
1355.90	121.	22.	22.	22.
1357.20	137.	91.	91.	91.
1357.70	144.	182.	208.	235.
1358.20	152.	380.	468.	557.
1358.70	159.	657.	834.	1011.
1359.20	167.	1008.	1298.	1588.
1359.70	174.	1452.	1886.	2320.
1360.00	179.	1776.	2316.	2856.
1360.20	182.	1988.	2598.	3208.
1361.20	200.	3190.	4200.	5210.
1363.20	236.	6358.	8423.	10488.
1364.00	250.	7974.	10577.	13180.
1365.20	272.	10396.	13806.	17216.
1367.99	322.	17610.	23424.	29238.

Super 11/2/71
JEP 12/1/71

 PLUMB AND LOGASH PACKAGE (HFC-11)
 DATA SETTY VERSTUJ JULY 1974
 LAST MODIFICATION 20 FEB 79
 MODIFIED FOR IMPROVEMENT APR 79

 NEW YORK STATE
 DEPT OF ENVIRONMENTAL CONSERVATION
 FLOOD PROTECTION BUREAU

 A1 CLARKS CREEK PROJECT SITE 1
 A2 ANALYSIS PPF WITH RATIOS
 A3 UATE
 R 20C
 R1 5

 J 2 2 1
 J1 .5 1
 K C 1
 K1

INFLOW HYDROGRAPH

M 1 1 .84 .689 1

P C 20 111 123 132 142

T 1 .1

A 2.1 .625

A 2 2 1

K 1 1 1

K1 ROUTED HYDROGRAPH AT DAM NO BREACH

V 1 1 1

-1355.9 -1

V1 1 1

V41325.1 1355.9 1357.2 1358.6 1361.6

V5 C 23 91 760 5126

S5 7.2 113 129 150 199.8

SF1325.1 1355.9 1357.2 1358.6 1361.6

SF1355.9

SF1361.6 2.6 1.5 1250

K 99

A

A

A

A

A

A

A

 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 LAST MODIFICATION JULY 1979
 MODIFIED FOR HONEYWELL APR 79

 NEW YORK STATE
 DEPT OF ENVIRONMENTAL CONSERVATION
 FLOOD PROTECTION BUREAU

RUN DATE 07/23/80

CLARKS CREEK PROJECT SITE 1
 ANALYSIS PMF WITH RATIOS
 DATE

JOB SPECIFICATION
 NO HHR AMIN IDAY IHR IMIN METRC IPLY IPRT NSTAN
 200 0 15 0 0 0 0 0 0 0 0
 JOPER NWT LRPT TRACE
 5 0 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED
 NPLAN= 1 NRTID= 2 LRTID= 1
 RTICS= 0.50 1.00

***** SUB-AREA RUNOFF COMPUTATION *****

INFLOW HYDROGRAPH

ISTAQ ICOMP IECON ITAPE IJPLY JPRY IANME IASTAGE IAUTO
 1 0 0 0 0 0 0 0 0 0

HYDROGRAPH DATA
 INYDG IUNG TAREA SNAP TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 1 0.84 0. 0.84 0.69 0. 0 0 1 0

PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0. 20.00 111.00 123.00 132.00 142.00 C. 0.

LOSS DATA
 LRPT STRKR OLTKR RTIOL ERAIN STRKS RTIDK STRTL CNSTL ALSAK RTIMP
 0 C. 0. 1.00 0. 0. 1.00 1.00 0.10 0. 0.

UNIT HYDROGRAPH DATA
 TP= 2.10 CP=0.63 NTA= 0

RECESSION DATA
 STRYQ= 2.00 QRC5N= 2.00 RTICR= 1.00
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 9.51 AND R= 7.69 INTERVALS

UNIT HYDROGRAPH 46 END-OF-PERIOD ORDINATES, LAG= 2.08 HOURS CP= 0.63 VDL= 1.00
 4. 24. 48. 75. 104. 131. 151. 166. 157.
 140. 123. 108. 95. 83. 73. 64. 56. 49.
 32. 29. 26. 22. 20. 17. 15. 13. 12.
 10. 9. 8. 7. 6. 5. 4. 3. 3.
 3. 2. 2. 2. 2. 1. 1. 1. 1.

END-OF-PERIOD FLOW
 MQ.OA H2.H PERIOD RAIN EXCS LOSS COMP Q MQ.OA +R.MA PERIOD RAIN EXCS LCSS COMP Q
 1.01 0.15 1 0.00 0. 0.00 2. 1.02 1.15 101 0.02 0. 0.02 3.
 1.01 0.30 2 0.00 0. 0.00 2. 1.02 1.30 102 0.02 0. 0.02 3.
 1.01 0.45 3 0.00 0. 0.00 2. 1.02 1.45 103 0.02 0. 0.02 3.

1.00	4	0.00	0.00	2.	1.02	2.00	104	0.02	0.
1.01	5	0.00	0.00	2.	1.02	2.15	105	0.02	0.
1.15	6	0.00	0.00	2.	1.02	2.30	106	0.02	0.
1.30	7	0.00	0.00	2.	1.02	2.45	107	0.02	0.
1.45	8	0.00	0.00	2.	1.02	2.60	108	0.02	0.
2.00	9	0.00	0.00	2.	1.02	2.75	109	0.02	0.
2.15	10	0.00	0.00	2.	1.02	2.90	110	0.02	0.
2.30	11	0.00	0.00	2.	1.02	3.05	111	0.02	0.
2.45	12	0.00	0.00	2.	1.02	3.20	112	0.02	0.
3.00	13	0.00	0.00	2.	1.02	3.35	113	0.02	0.
3.15	14	0.00	0.00	2.	1.02	3.50	114	0.02	0.
3.30	15	0.00	0.00	2.	1.02	3.65	115	0.02	0.
3.45	16	0.00	0.00	2.	1.02	3.80	116	0.02	0.
4.00	17	0.00	0.00	2.	1.02	3.95	117	0.02	0.
4.15	18	0.00	0.00	2.	1.02	4.10	118	0.02	0.
4.30	19	0.00	0.00	2.	1.02	4.25	119	0.02	0.
4.45	20	0.00	0.00	2.	1.02	4.40	120	0.02	0.
5.00	21	0.00	0.00	2.	1.02	4.55	121	0.02	0.
5.15	22	0.00	0.00	2.	1.02	4.70	122	0.02	0.
5.30	23	0.00	0.00	2.	1.02	4.85	123	0.02	0.
5.45	24	0.00	0.00	2.	1.02	5.00	124	0.02	0.
6.00	25	0.01	0.01	2.	1.02	5.15	125	0.02	0.
6.15	26	0.01	0.01	2.	1.02	5.30	126	0.02	0.
6.30	27	0.01	0.01	2.	1.02	5.45	127	0.02	0.
6.45	28	0.01	0.01	2.	1.02	5.60	128	0.02	0.
7.00	29	0.01	0.01	2.	1.02	5.75	129	0.02	0.
7.15	30	0.01	0.01	2.	1.02	5.90	130	0.02	0.
7.30	31	0.01	0.01	2.	1.02	6.05	131	0.02	0.
7.45	32	0.01	0.01	2.	1.02	6.20	132	0.02	0.
8.00	33	0.01	0.01	2.	1.02	6.35	133	0.02	0.
8.15	34	0.01	0.01	2.	1.02	6.50	134	0.02	0.
8.30	35	0.01	0.01	2.	1.02	6.65	135	0.02	0.
8.45	36	0.01	0.01	2.	1.02	6.80	136	0.02	0.
9.00	37	0.01	0.01	2.	1.02	6.95	137	0.02	0.
9.15	38	0.01	0.01	2.	1.02	7.10	138	0.02	0.
9.30	39	0.01	0.01	2.	1.02	7.25	139	0.02	0.
9.45	40	0.01	0.01	2.	1.02	7.40	140	0.02	0.
10.00	41	0.01	0.01	2.	1.02	7.55	141	0.02	0.
10.15	42	0.01	0.01	2.	1.02	7.70	142	0.02	0.
10.30	43	0.01	0.01	2.	1.02	7.85	143	0.02	0.
10.45	44	0.01	0.01	2.	1.02	8.00	144	0.02	0.
11.00	45	0.01	0.01	2.	1.02	8.15	145	0.02	0.
11.15	46	0.01	0.01	2.	1.02	8.30	146	0.02	0.
11.30	47	0.01	0.01	2.	1.02	8.45	147	0.02	0.
11.45	48	0.01	0.01	2.	1.02	8.60	148	0.02	0.
12.00	49	0.03	0.03	2.	1.02	8.75	149	0.02	0.
12.15	50	0.03	0.03	2.	1.02	8.90	150	0.02	0.
12.30	51	0.03	0.03	2.	1.02	9.05	151	0.02	0.
12.45	52	0.03	0.03	2.	1.02	9.20	152	0.02	0.
13.00	53	0.03	0.03	2.	1.02	9.35	153	0.02	0.
13.15	54	0.03	0.03	2.	1.02	9.50	154	0.02	0.
13.30	55	0.03	0.03	2.	1.02	9.65	155	0.02	0.
13.45	56	0.03	0.03	2.	1.02	9.80	156	0.02	0.
14.00	57	0.04	0.04	2.	1.02	9.95	157	0.02	0.
14.15	58	0.04	0.04	2.	1.02	10.10	158	0.02	0.
14.30	59	0.04	0.04	2.	1.02	10.25	159	0.02	0.
14.45	60	0.04	0.04	2.	1.02	10.40	160	0.02	0.
15.00	61	0.04	0.04	2.	1.02	10.55	161	0.02	0.
15.15	62	0.04	0.04	2.	1.02	10.70	162	0.02	0.
15.30	63	0.04	0.04	2.	1.02	10.85	163	0.02	0.
15.45	64	0.04	0.04	2.	1.02	11.00	164	0.02	0.
16.00	65	0.04	0.04	2.	1.02	11.15	165	0.02	0.
16.15	66	0.04	0.04	2.	1.02	11.30	166	0.02	0.
16.30	67	0.04	0.04	2.	1.02	11.45	167	0.02	0.
16.45	68	0.04	0.04	2.	1.02	11.60	168	0.02	0.
17.00	69	0.04	0.04	2.	1.02	11.75	169	0.02	0.
17.15	70	0.04	0.04	2.	1.02	11.90	170	0.02	0.

[illegible]

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CPS	1577.	1087.	357.	174.		34701.
CHS	45.	31.	10.	5.		983.
INCHES		12.04	15.81	16.01		16.01
MM		305.77	401.57	406.71		406.71
AC-FT		539.	708.	717.		717.
T-DLS CU W		665.	873.	884.		884.

ROUTED HYDROGRAPH AT DAM NO BREACH																			
		I STAQ	1	ICOMP	1	IECON	0	ITAPE	C	JPLT	0	JPRT	C	INAME	1	ISTAGE	0	IAUTO	0
ROUTING DATA																			
QLOSS		O.	CLOSS	O.	AVG	O.	IKES	1	ISAME	1	IDPT	0	IPPP	0			LSTR	0	
NSTPS		1	NSTDL	0	LAG	0	AMSCK	0	X	0	TSK	0	STGR	-1396			ISPRAT	-1	

STAGE	1334.10	1355.90	1357.20	1358.60	1361.60
FLOW	0.	23.00	91.00	763.00	5126.00
CAPACITY	7.	113.	129.	150.	200.
ELEVATIONS	1335.	1356.	1357.	1358.	1362.

END-OF-PERIOD PYROGRAPH CRIMATES

OUTFLOW			
23.	23.	23.	23.
22.	22.	22.	22.
21.	21.	21.	21.
20.	20.	20.	20.
19.	19.	19.	19.
18.	18.	18.	18.
17.	17.	17.	17.
16.	16.	16.	16.
15.	15.	15.	15.
14.	14.	14.	14.
13.	13.	13.	13.
12.	12.	12.	12.
11.	11.	11.	11.
10.	10.	10.	10.
9.	9.	9.	9.
8.	8.	8.	8.
7.	7.	7.	7.
6.	6.	6.	6.
5.	5.	5.	5.
4.	4.	4.	4.
3.	3.	3.	3.
2.	2.	2.	2.
1.	1.	1.	1.
0.	0.	0.	0.

STORAGE			
112.	112.	111.	111.
108.	107.	106.	106.
104.	103.	103.	102.
99.	99.	99.	98.
96.	95.	94.	94.
92.	92.	91.	90.
88.	88.	87.	87.
85.	85.	85.	85.
84.	83.	83.	82.
81.	80.	80.	79.
78.	77.	77.	77.
75.	75.	74.	74.
72.	72.	72.	71.
73.	73.	73.	74.
72.	72.	73.	75.
77.	78.	79.	80.
89.	92.	101.	112.
139.	142.	147.	106.
149.	146.	145.	149.
134.	133.	131.	143.
129.	127.	127.	131.
128.	127.	126.	125.
109.	109.	109.	110.
105.	105.	106.	106.
101.	101.	101.	102.
97.	97.	98.	98.
93.	93.	94.	94.
89.	89.	90.	90.
86.	86.	86.	86.
84.	84.	84.	84.
81.	82.	82.	82.
79.	79.	79.	79.
76.	76.	76.	76.
73.	73.	73.	73.
72.	72.	72.	72.
76.	75.	75.	75.
84.	83.	81.	80.
131.	124.	118.	106.
149.	150.	150.	149.
136.	139.	142.	143.
129.	129.	130.	131.
122.	123.	124.	125.

STAGE									
1355.0	1355.7	1355.6	1355.5	1355.5	1355.4	1355.3	1355.2	1355.1	1355.0
1354.9	1354.9	1354.8	1354.7	1354.6	1354.5	1354.4	1354.4	1354.3	1354.2
1354.1	1354.0	1353.9	1353.9	1353.8	1353.7	1353.6	1353.5	1353.5	1353.4
1353.3	1353.2	1353.2	1353.1	1353.0	1352.9	1352.9	1352.8	1352.7	1352.6
1352.6	1352.5	1352.4	1352.3	1352.3	1352.2	1352.1	1352.0	1352.0	1351.9
1351.8	1351.8	1351.7	1351.6	1351.5	1351.5	1351.4	1351.3	1351.3	1351.2
1351.1	1351.1	1351.0	1350.9	1350.9	1350.8	1350.7	1350.6	1350.6	1350.5
1350.5	1350.5	1350.4	1350.4	1350.4	1350.3	1350.3	1350.3	1350.2	1350.2
1350.2	1350.1	1350.1	1350.0	1350.0	1349.9	1349.5	1349.8	1349.7	1349.7
1349.6	1349.6	1349.5	1349.5	1349.4	1349.4	1349.3	1349.2	1349.2	1349.1
1349.1	1349.0	1349.0	1348.9	1348.8	1348.8	1348.7	1348.7	1348.6	1348.6
1348.4	1348.4	1348.4	1348.3	1348.3	1348.2	1348.2	1348.1	1348.1	1348.0

PEAK OUTFLOW IS 770. AT TIME 42.00 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
770.	515.	156.	84.	1653.
22.	15.	4.	2.	478.
	5.71	6.91	7.80	7.80
	146.99	175.47	197.99	197.99
	256.	309.	349.	349.
	315.	382.	431.	431.

STATION 1, PLAN 1, RATIO 2
END-OF-PERIOD HYDROGRAPH ORDINATES

		OUTFLOW		STORAGE	
23.	23.	23.	22.	111.	112.
22.	22.	22.	22.	107.	103.
21.	21.	21.	21.	103.	104.
20.	20.	20.	20.	99.	100.
19.	19.	19.	19.	96.	96.
18.	18.	18.	18.	93.	93.
17.	17.	17.	17.	89.	89.
16.	16.	16.	16.	87.	87.
15.	15.	15.	15.	86.	86.
14.	14.	14.	14.	84.	84.
13.	13.	13.	13.	81.	81.
12.	12.	12.	12.	78.	78.
11.	11.	11.	11.	76.	76.
10.	10.	10.	10.	74.	74.
9.	9.	9.	9.	72.	72.
8.	8.	8.	8.	70.	70.
7.	7.	7.	7.	68.	68.
6.	6.	6.	6.	66.	66.
5.	5.	5.	5.	64.	64.
4.	4.	4.	4.	62.	62.
3.	3.	3.	3.	60.	60.
2.	2.	2.	2.	58.	58.
1.	1.	1.	1.	56.	56.
				54.	54.
				52.	52.
				50.	50.
				48.	48.
				46.	46.
				44.	44.
				42.	42.
				40.	40.
				38.	38.
				36.	36.
				34.	34.
				32.	32.
				30.	30.
				28.	28.
				26.	26.
				24.	24.
				22.	22.
				20.	20.
				18.	18.
				16.	16.
				14.	14.
				12.	12.
				10.	10.
				8.	8.
				6.	6.
				4.	4.
				2.	2.
				0.	0.

131.	131.	130.	129.	129.	125.	124.	127.	127.
1355.8	1355.7	1345.6	1355.6	1355.4	1355.3	1355.2	1355.1	1355.1
1355.0	1354.9	1354.8	1354.7	1354.6	1354.5	1354.4	1354.3	1354.3
1354.2	1354.1	1354.0	1353.9	1353.8	1353.7	1353.7	1353.6	1353.5
1353.4	1353.3	1353.2	1353.1	1353.0	1352.9	1352.9	1352.8	1352.8
1352.7	1352.6	1352.5	1352.4	1352.3	1352.3	1352.2	1352.1	1352.1
1352.0	1351.9	1351.8	1351.7	1351.6	1351.5	1351.5	1351.4	1351.4
1351.3	1351.2	1351.1	1351.0	1350.9	1350.8	1350.8	1350.7	1350.6
1350.8	1350.7	1350.6	1350.5	1350.4	1350.3	1350.3	1350.2	1350.1
1350.4	1350.3	1350.2	1350.1	1350.0	1349.9	1349.8	1349.7	1349.6
1349.8	1349.7	1349.6	1349.5	1349.4	1349.3	1349.2	1349.1	1349.0
1349.3	1349.2	1349.1	1349.0	1348.9	1348.8	1348.7	1348.6	1348.5
1348.7	1348.6	1348.5	1348.4	1348.3	1348.2	1348.1	1348.0	1347.9
1348.0	1347.9	1347.8	1347.7	1347.6	1347.5	1347.4	1347.3	1347.2
1347.3	1347.2	1347.1	1347.0	1346.9	1346.8	1346.7	1346.6	1346.5
1346.8	1346.7	1346.6	1346.5	1346.4	1346.3	1346.2	1346.1	1346.0
1346.3	1346.2	1346.1	1346.0	1345.9	1345.8	1345.7	1345.6	1345.5
1345.7	1345.6	1345.5	1345.4	1345.3	1345.2	1345.1	1345.0	1344.9
1345.0	1344.9	1344.8	1344.7	1344.6	1344.5	1344.4	1344.3	1344.2
1344.2	1344.1	1344.0	1343.9	1343.8	1343.7	1343.6	1343.5	1343.4
1343.7	1343.6	1343.5	1343.4	1343.3	1343.2	1343.1	1343.0	1342.9
1343.0	1342.9	1342.8	1342.7	1342.6	1342.5	1342.4	1342.3	1342.2
1342.7	1342.6	1342.5	1342.4	1342.3	1342.2	1342.1	1342.0	1341.9
1342.0	1341.9	1341.8	1341.7	1341.6	1341.5	1341.4	1341.3	1341.2
1341.3	1341.2	1341.1	1341.0	1340.9	1340.8	1340.7	1340.6	1340.5
1340.7	1340.6	1340.5	1340.4	1340.3	1340.2	1340.1	1340.0	1339.9
1340.0	1339.9	1339.8	1339.7	1339.6	1339.5	1339.4	1339.3	1339.2
1339.2	1339.1	1339.0	1338.9	1338.8	1338.7	1338.6	1338.5	1338.4
1338.7	1338.6	1338.5	1338.4	1338.3	1338.2	1338.1	1338.0	1337.9
1338.0	1337.9	1337.8	1337.7	1337.6	1337.5	1337.4	1337.3	1337.2
1337.3	1337.2	1337.1	1337.0	1336.9	1336.8	1336.7	1336.6	1336.5

PEAK OUTFLOW IS 1967. AT TIME 41.75 HOURS

CFS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CMS	1567.	1080.	334.	170.	34023.	
INCHES	44.	31.	9.	5.	983.	
MM		11.96	14.80	15.70	15.70	
AC-FT		303.68	375.84	398.75	398.75	
T-OLS CU M		535.	663.	703.	703.	
		660.	817.	867.	867.	

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECUMENIC COMPUTATIONS
 FLOWS IN CURIC FEET PER SECOND (CURIC METERS PER SECOND)
 AREA IN SQUARE FEET (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS	
				RATIO 1	RATIO 2
HYDROGRAPH AT	1	0.04	1	0.50	1.00
	(0.00)	(22.33)	1577.
ADJUST TO	1	0.04	1	770.	44.67)
	(0.00)	(21.00)	1567.
					44.36)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

RATIO	ELEVATION STORAGE OUTFLOW	INITIAL VALUE 1355.90 113. 23.	SPILLWAY CREST 1355.90 113. 23.	TOP OF DAM 1361.60 200. 5126.	CLARATION OVER TCP +HOURS 0. 0.	TIME OF MAX OUTFLOW HOURS 42.00 41.75	TYPE OF FAILURE +CLAS 0. 0.
MAXIMUM							
RESERVOIR							
U.S. FLEV							
1354.61							
1359.15							
MAXIMUM							
STORAGE							
AC-FT							
150.							
159.							
MAXIMUM							
DEPTH							
OVER DAM							
0.							
0.							
MAXIMUM							
OUTFLOW							
CFS							
770.							
1367.							

APPENDIX D

STABILITY COMPUTATIONS

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UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE - Soil Mechanics Laboratory

800 "J" Street, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York RCD-25, Clark's Creek Dam
(Chenango County)

DATE: September 21, 1971

TO: Richard L. Phillips, State Conservation Engineer,
SCS, Syracuse, New York

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-355A & B, Triaxial Shear Test Data, 1 test, 2 sheets.
3. Form SCS-366, Direct Shear Test, 1 sheet.
4. Form SCS-352, Compaction and Penetration Resistance, 1 sheet.
5. Form SCS-357, Summary - Slope Stability Analysis, 3 sheets.

INTRODUCTION

The proposed 47-foot high, Class C hazard dam is in the glaciated Allegheny Plateau physiographic province in Chenango County, New York. The glacial till of Wisconsin Age is very dense. Bedrock was not encountered in any of the test holes, one of which extended to a depth of 46 feet in the flood plain.

No major engineering problems are anticipated at this site with fill placed at a minimum density of 100% of Standard Proctor density (ASTM D-698, Method A).

DISCUSSION

FOUNDATION

- A. Classification. Approximately 1 foot of loose, medium density top soil (ML-SM) mantles the glacial till.

The underlying glacial till is sandy with silt and gravel.

- B. Dry Unit Weight. Standard penetration tests in the surface 10 feet of till yielded blow count generally in the range of 25 to 35 blows per foot. Below 10 feet, the blow count generally exceeded 100 blows/foot.
- C. Permeability. Considerable seepage was encountered in some of the test pits in the flood plain in the surface 7.5 feet; however, field permeability tests at the same depths exhibited only very slight leakage.



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Considerable difficulty was experienced in keeping the deeper holes open due to caving.

Springs occur at the base of the right abutment at the site. The dense underlying till causes a perched water table condition in the loose top soil layer.

- D. Shear Strength and Consolidation Potential. The high blow count materials are expected to have high strength and low consolidation potential. Shear parameters of $\phi = 35^\circ$ and $c = 0$ psf are assumed for the lower blow count shallow till foundation materials.

EMBANKMENT

- A. Classification. Most of the borrow material will consist of glacial till. The sample submitted to the laboratory is an SC-SM material with a liquid limit of 19 and a plasticity index of 4. It contains 26% gravel, 29% sand, and 45% fines. Boulders up to 36 inches in diameter occur in the surface few feet.
- B. Compacted Dry Density. A Standard Proctor compaction test (ASTM D-698, Method A) was made on the minus No. 4 fraction of the SC-SM till material. The maximum dry density was 123.0 pcf and the optimum moisture content was 11.0%.
- C. Shear Strength. A consolidated undrained triaxial shear test was made on the minus No. 4 material at a compacted density of approximately 97% of Standard Proctor density. The test specimens were saturated by backpressuring, after being molded wet of optimum. The test data was interpreted to give saturated total stress shear parameters of $\phi = 13^\circ$ and $c = 425$ psf. Effective stress shear parameters were $\bar{\phi} = 26^\circ$ and $\bar{c} = 150$ psf.

A subsequent direct shear test was made on specimens compacted to 100% of Standard Proctor density. The test data was interpreted to give shear parameters of $\phi = 34^\circ$ and $c = 100$ psf.

STABILITY ANALYSIS

The stability of the proposed 47-foot high embankment was analyzed using a modified Swedish circle method. The dense foundation material is expected to be sufficiently strong to limit any failure surface to the embankment; however, several circles were also cut into the upper 10 to 16 feet of the foundation material.

Shear parameters of $\phi = 35^\circ$ and $c = 0$ psf were assumed for the upper 16 feet of the foundation. For the compacted embankment materials at 97% of Standard density, total stress shear parameters of $\phi = 13^\circ$ and $c = 425$ psf were used.

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A full drawdown analysis of the 3:1 upstream slope shows a 24-foot berm is required at elevation 1334.5 for a safety factor of 1.35. The steady seepage analysis of the $2\frac{1}{2}$:1 downstream slope with a drain at $c/b = 0.6$ shows a 25-foot berm is needed at elevation 1338.0 to obtain a safety factor of 1.50 (see Trial #1A in the slope stability summary in the attachments).

Subsequent stability analyses using the direct shear test values of $\phi = 34^\circ$ and $c = 100$ psf for the till material compacted to 100% of Standard Proctor density show a full drawdown analysis of the 3:1 upstream slope with a 10-foot berm at elevation 1334.5 gives a safety factor of 1.54 (see Trial #8 in the slope stability summary). The steady seepage analysis of the downstream $2\frac{1}{2}$:1 slope with a drain at $c/b = 0.6$ gave a safety factor of 1.62 without any berm.

RECOMMENDATIONS

- A. Site Preparation. Removal of the soft, wet top soil on the right side of the flood plain and in the right abutment is recommended.
- B. Centerline Cutoff. A normal width cutoff with 1:1 side slopes extending down to a depth of 7 to 10 feet is recommended to cut off the small pockets of highly permeable material as encountered in test pit #7. Backfill with the till borrow material. Place at or wet of optimum and compact to a minimum density of 100% of Standard Proctor density.
- C. Principal Spillway. The proposed location appears to be adequate. A horizontal strain of 0.002 ft/ft is suggested for pipe elongation for joint design. A ϕ angle of 34° is recommended for conduit loading calculations.
- D. Drainage. A shallow foundation trench drain at $c/b = 0.6$ is recommended below the permanent pool elevation to prevent the phreatic line in the embankment from emerging on the downstream slope and to provide a controlled outlet for foundation seepage that by-passes the centerline cutoff.
- E. Embankment Design. The following are recommended:
 1. Provide a homogeneous embankment of the SC-SM till material compacted to a minimum density of 100% of Standard Proctor density.
 2. Place the till borrow material at or wet of optimum.
 3. Provide 3:1 upstream slopes with a 10-foot berm at elevation 1334.5 and a $2\frac{1}{2}$:1 downstream slope with a drain at $c/b = 0.6$.

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- 4.. Provide an overfill of 0.6 foot across the flood plain to compensate for residual settlement after construction is complete.

Prepared by:



Edgar F. Steele
Acting Head
Soil Mechanics Laboratory

Attachments

cc:

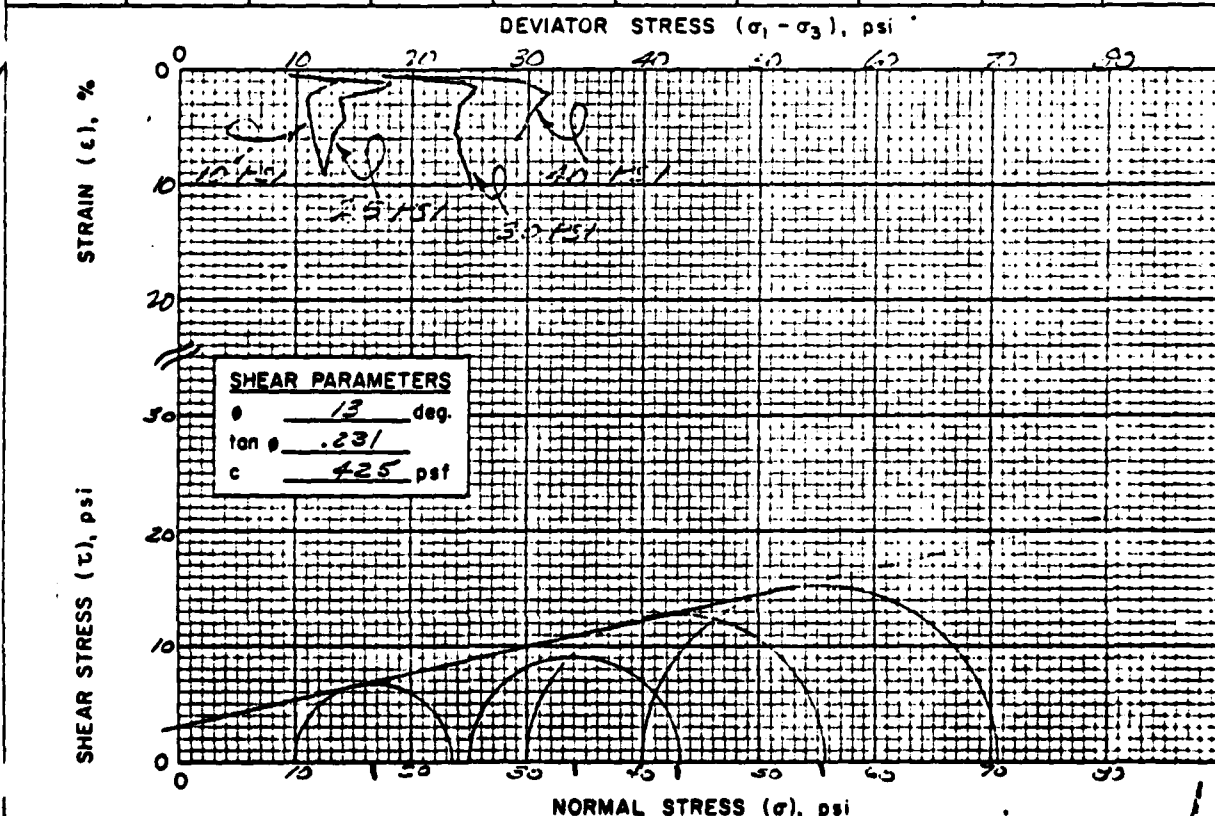
R. L. Phillips
L. C. Ibbitson, SCS, Syracuse, N.Y.
B. S. Ellis, SCS, Syracuse, N.Y.
N. F. Bogner, Head, EWPU, SCS, Upper Darby, Pa.
Edward Blackmer, SCS, Binghamton, N.Y.

MATERIALS TESTING REPORT U. S. DEPARTMENT of AGRICULTURE
SOIL CONSERVATION SERVICE **TRIAxIAL SHEAR TEST**

PROJECT and STATE <u>CLACKS CREEK DAM NEW YORK</u>		SAMPLE LOCATION <u>ROCKAW</u>	
FIELD SAMPLE NO. <u>105.1</u>	DEPTH	GEOLOGIC ORIGIN <u>Glacial Till (Wisconsin)</u>	
TYPE OF SAMPLE <u>COMPACTED</u>	TESTED AT <u>SMI-LINCOLN</u>	APPROVED BY <u>Edgar F Steele</u>	DATE <u>9/14/71</u>

INDEX TEST DATA		SPECIMEN DATA		TYPE OF TEST
USCS <u>SC-SM</u> ; LL <u>19</u> ; PI <u>4</u>		HEIGHT <u>3.0</u> "; DIAMETER <u>1.2</u> "		UU <input type="checkbox"/> CU <input type="checkbox"/> CU <input checked="" type="checkbox"/> CD <input type="checkbox"/>
% FINER (mm): 0.002 <u>10</u> ; 0.005 <u>17</u> ; 0.074 (#200) <u>45</u>		MATERIALS TESTED PASSED <u>#4</u> SIEVE		
G_s (-#4) <u>2.73</u> ; G_s (+#4) <u>2.73</u>		METHOD OF PREPARATION <u>STATIC 3</u>		
STANDARD: γ_d MAX. <u>123.0</u> pcf; w_o <u>11.0</u> %		MOLDING MOISTURE <u>11.2</u> %		
MODIFIED: γ_d MAX. _____ pcf; w_o _____%		MOLDED AT <u>97.5</u> % OF γ_d MAXIMUM		

DRY DENSITY		B Parameter	MOISTURE CONTENT, %			TIME OF CONSOLIDATION (hrs.)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ϵ (%)
INITIAL pcf <input checked="" type="checkbox"/>	CONSOLIDATED pcf <input type="checkbox"/>		START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST				
119.7		0.99			15.4	87.68	10	154	1.0
119.7		0.96			15.3	15.50	25	13.0	1.1
120.0		1.00			14.8	16.00	40	30.6	1.5
120.3		0.98			14.6	15.92	30	25.6	1.5



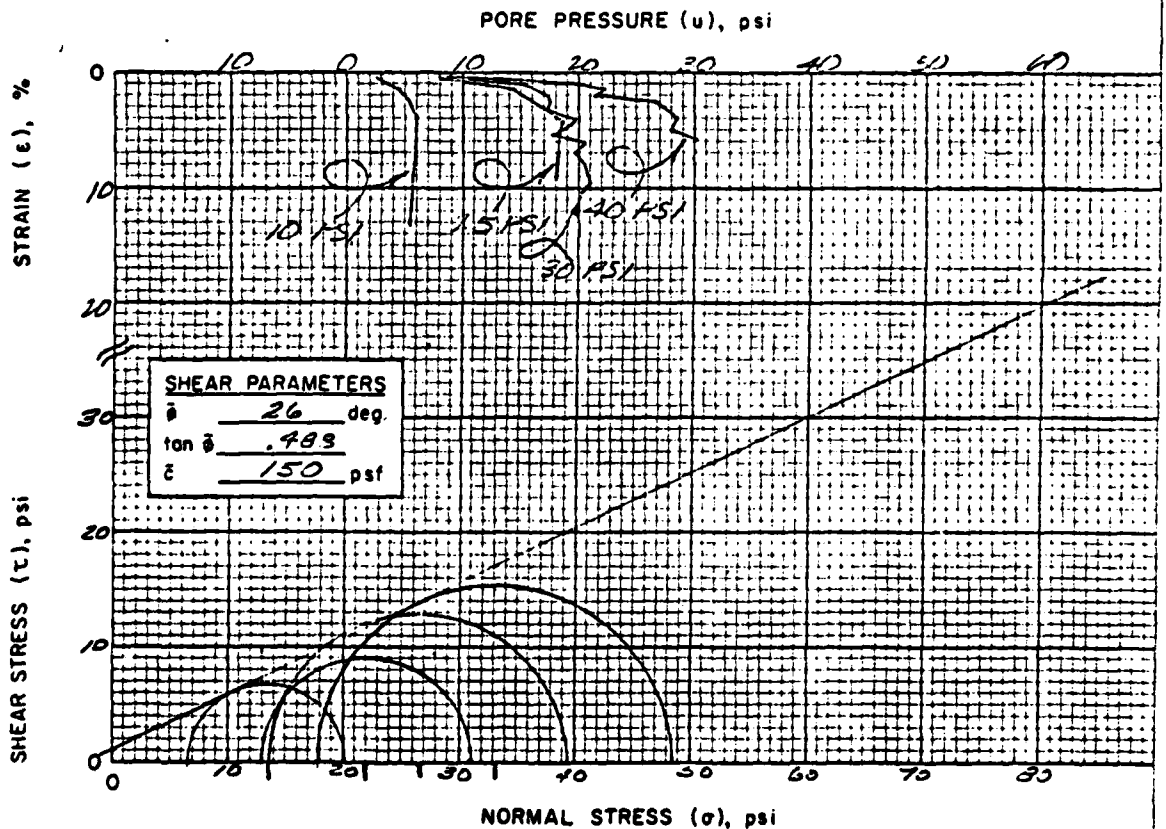
REMARKS BACK-PRESSURED

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MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST with pore pressure measured
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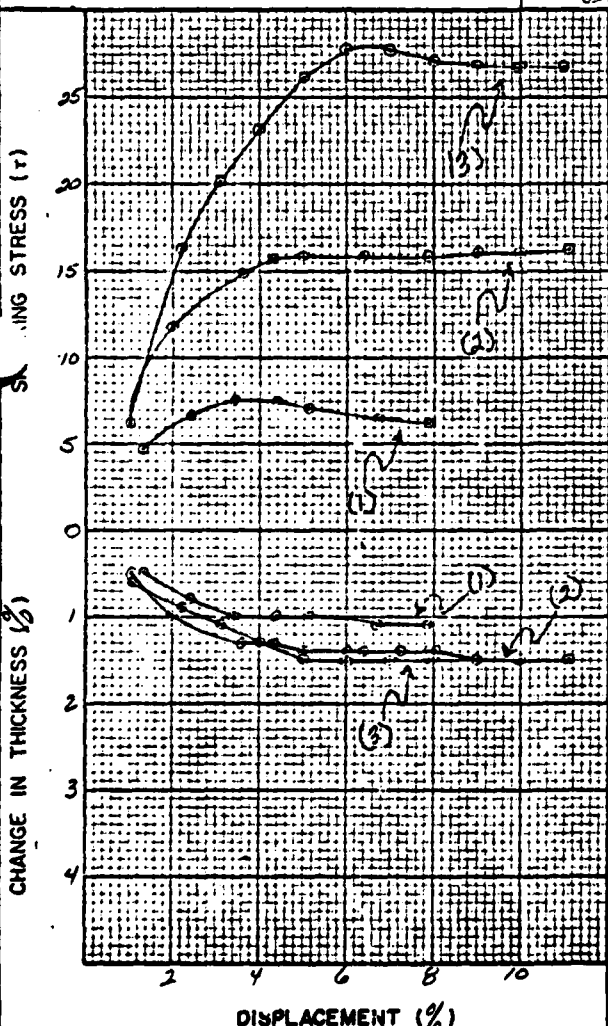
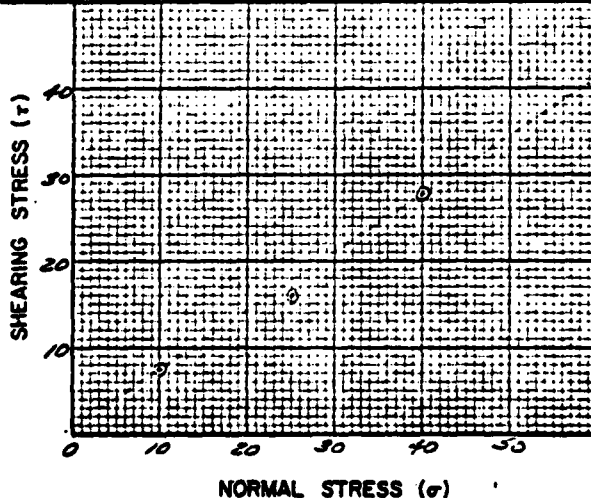
PROJECT and STATE <u>CLARK CREEK DAM NEW YORK</u>			SAMPLE LOCATION		
TYPE OF SAMPLE <u>COMPACTED</u>		TESTED AT <u>SML. LINCOLN</u>		APPROVED BY <u>CPJ</u>	
DATE <u>9/14/71</u>					

MINOR PRINCIPAL STRESS, σ_3 (psi)	PORE PRESSURE, u (psi)	EFFECTIVE MINOR PRINCIPAL STRESS, $\bar{\sigma}_3$ (psi)	DEVIATOR STRESS, $\sigma_1 - \sigma_3$ (psi)	FAILURE CRITERIA	AXIAL STRAIN AT FAILURE, E (%)
10	3.4	6.6	13.4		1.0
25	12.0	13.0	18.0		1.1
40	22.1	17.9	30.6		1.5
30	16.2	13.8	25.6		1.5



REMARKS BACK-PRESSURED

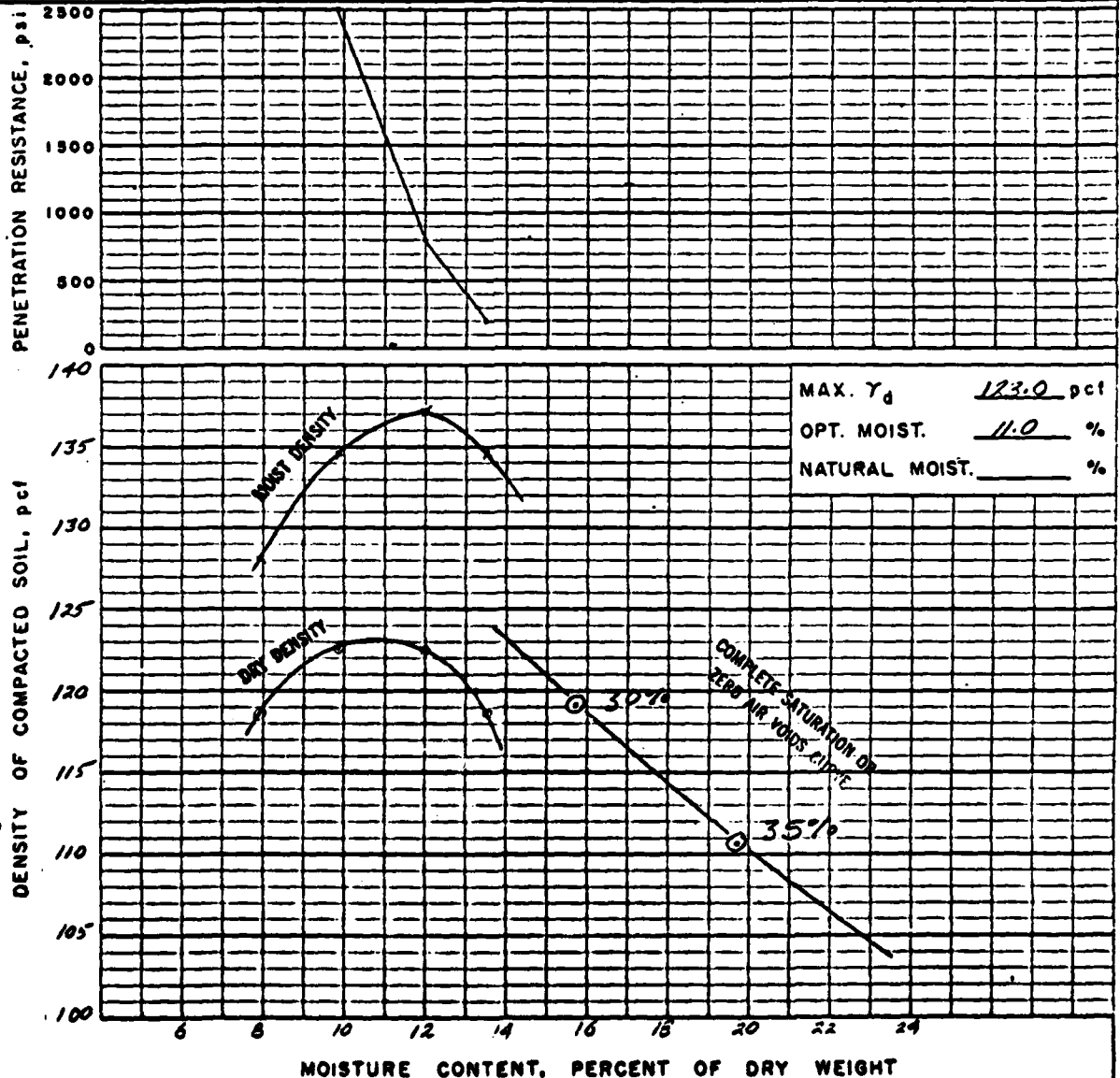
CPJ/ans.

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST					
PROJECT and STATE CLARK CREEKS DAM NEW YORK			SAMPLE LOCATION BORROW						
FIELD SAMPLE NO. 105.1	DEPTH	GEOLOGIC ORIGIN							
TYPE OF SAMPLE COMPACTED	TESTED AT SML LINCOLN	APPROVED BY		DATE					
CLASSIFICATION SC-SM		LL 19 PI 4		SPECIFIC GRAVITY					
TYPE OF TEST		CONTROL STRAIN		$G_s(-)^{\#4}$	2.73				
RATE OF LOADING (in/min.) 0.00055		MOISTURE CONDITION FLOODED		$G_s(+)^{\#4}$					
TYPE OF SPECIMEN		AREA (sq in.) 6.25	THICKNESS (in.) 1.0	$G_m(bulk)(+)^{\#4}$					
				TEST NO.	1	2	3	4	
				INIT. MOISTURE, %	11.3	11.3	11.3		
				DRY DENSITY, $\frac{lb}{cu\ ft}$	122.6	122.7	123.5		
				INIT. VOID RATIO	.3900	.3886	.3801		
				TEST DURATION, (min.)	288	497	501		
				FINAL MOISTURE, %	12.2	12.7	12.0		
				NORMAL STRESS	10	25	40		
				MAX. SHEAR STRESS	7.6	15.9	27.7		
				SHEAR VALUES		ϕ		c	
				AT MAXIMUM STRESS		34°		100	
				SHEARING STRESS (τ)					
				NORMAL STRESS (σ)					

REMARKS AVERAGE TEST $\gamma = 99.9\%$ STD.276
P.H.H.

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE
-------------------------------------	----------------------------------------------------------------------	--------------------------------------------------

PROJECT and STATE <u>Clark's Creek Dam</u> <u>NEW YORK</u>		
FIELD SAMPLE NO <u>105.1</u>	LOCATION <u>Borrow</u>	DEPTH
GEOLOGIC ORIGIN <u>Wisconsin Glacial Till</u>	TESTED AT <u>SML- LINCOLN</u>	APPROVED BY <u>Edgar F. Steele</u>
		DATE <u>9/14/71</u>
CLASSIFICATION <u>SC- SM</u> LL <u>19</u> PI <u>4</u>	CURVE NO. <u>1</u> OF <u>1</u>	
MAX. PARTICLE SIZE INCLUDED IN TEST <u>< #4</u>	STD. (ASTM D-698) <input checked="" type="checkbox"/> ; METHOD <u>A</u>	
SPECIFIC GRAVITY (G _s) { MINUS NO. 4 <u>2.73</u> PLUS NO. 4 <u>2.73</u>	MOD. (ASTM D-1557) <input type="checkbox"/> ; METHOD _____	
OTHER TEST <input type="checkbox"/> (SEE REMARKS)		



REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION
GRADATION OF TOTAL SAMPLE

= NO. 200 75 %; = NO. 4 24 %; = 3 IN. 100 %

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		SUMMARY - SLOPE STABILITY ANALYSIS			
PROJECT and STATE CLARK'S CREEK DAM NEW YORK			DATE 9-20-71				
METHOD OF ANALYSIS SWEDISH CIRCLE			ANALYZED AT S.M. LINCOLN, N.Y.		APPROVED BY		
SOURCE AND USE OF MATERIALS	CLASSIFICATION	DESIGN DATA				REMARKS	
		Y _d (pcf)	Y _m (pcf)	Y _{sub} (pcf)	φ (deg)	c (psf)	
① Foundation		120.0	113.0	135.0	35	0	-Est. Va / u.c.
② Embankment	SC-SM	123.5	139.5	142.0	13	42.5	-CU-26% rock
③					26	150	-20
④ Embankment	SC-SM	130.9	142.0	145.5	34	100	
⑤							
⑥							
⑦							
⑧							
TRIAL NO.	SLOPE	CONDITIONS					F _o
Upstream - Full drawdown							
Maximum Section							
1Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (13°-42.5) only					1.20
1ADa	2 1/2:1	Drain @ c/s = 0.6 - Emb (13°-42.5) only - 25' berm @ elev. 1334.5					1.50
2 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) only					1.82
3 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) only					1.87
4 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) only					1.87
5 Da	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5					1.69
6 Da	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5					1.57
7 Da	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5					1.72
8 Da	3:1	Emb (34°-100) & 10' found (35°-0) - 10' berm @ elev. 1334.5					1.54
9 Da	3:1	Emb (34°-100) & 10' found (35°-0) - 10' berm @ elev. 1334.5					1.54
10 Da	2 1/2:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/s = 0.6					1.76
11 Da	2 1/2:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/s = 0.6					1.62
12 Da	2 1/2:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/s = 0.6					1.75
Flood Plain Section							
13 Da	3:1	Emb (34°-100) & 9' found (35°-0) - 10' berm @ elev. 1334.5					1.49
14 Da	3:1	Emb (34°-100) & 16' found (35°-0) - 10' berm @ elev. 1334.5					1.61
15 Da	3:1	Emb (34°-100) & 0' found (35°-0) - 10' berm @ elev. 1334.5					1.71
16 Da	3:1	Emb (34°-100) & 0' found (35°-0) - 10' berm @ elev. 1334.5					1.65
17 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) & 9' found (35°-0)					1.82
18 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) & 9' found (35°-0)					1.66
19 Da	2 1/2:1	Drain @ c/s = 0.6 - Emb (34°-100) & 9' found (35°-0)					1.92

APPENDIX E

REFERENCES

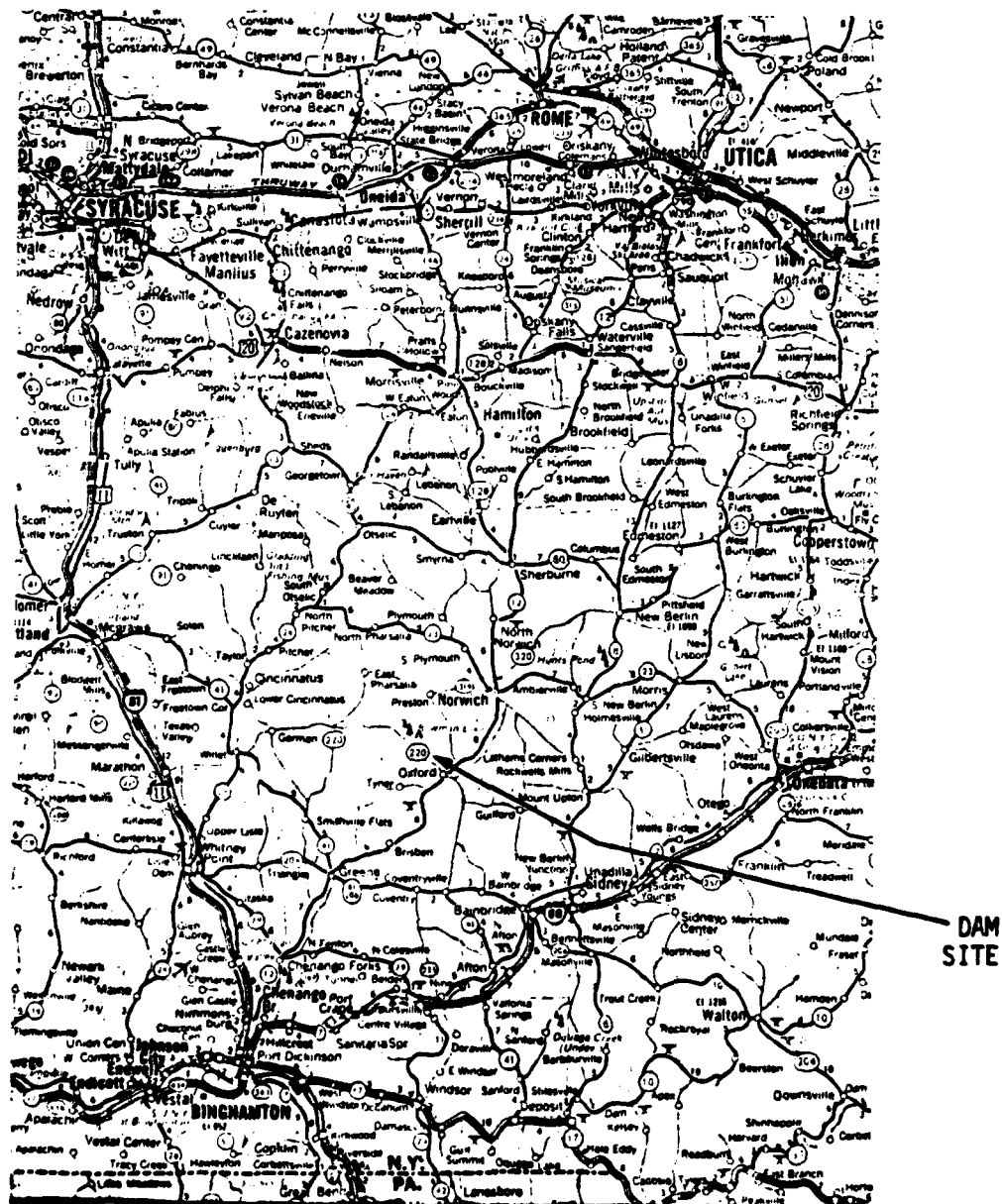
APPENDIX E

REFERENCES

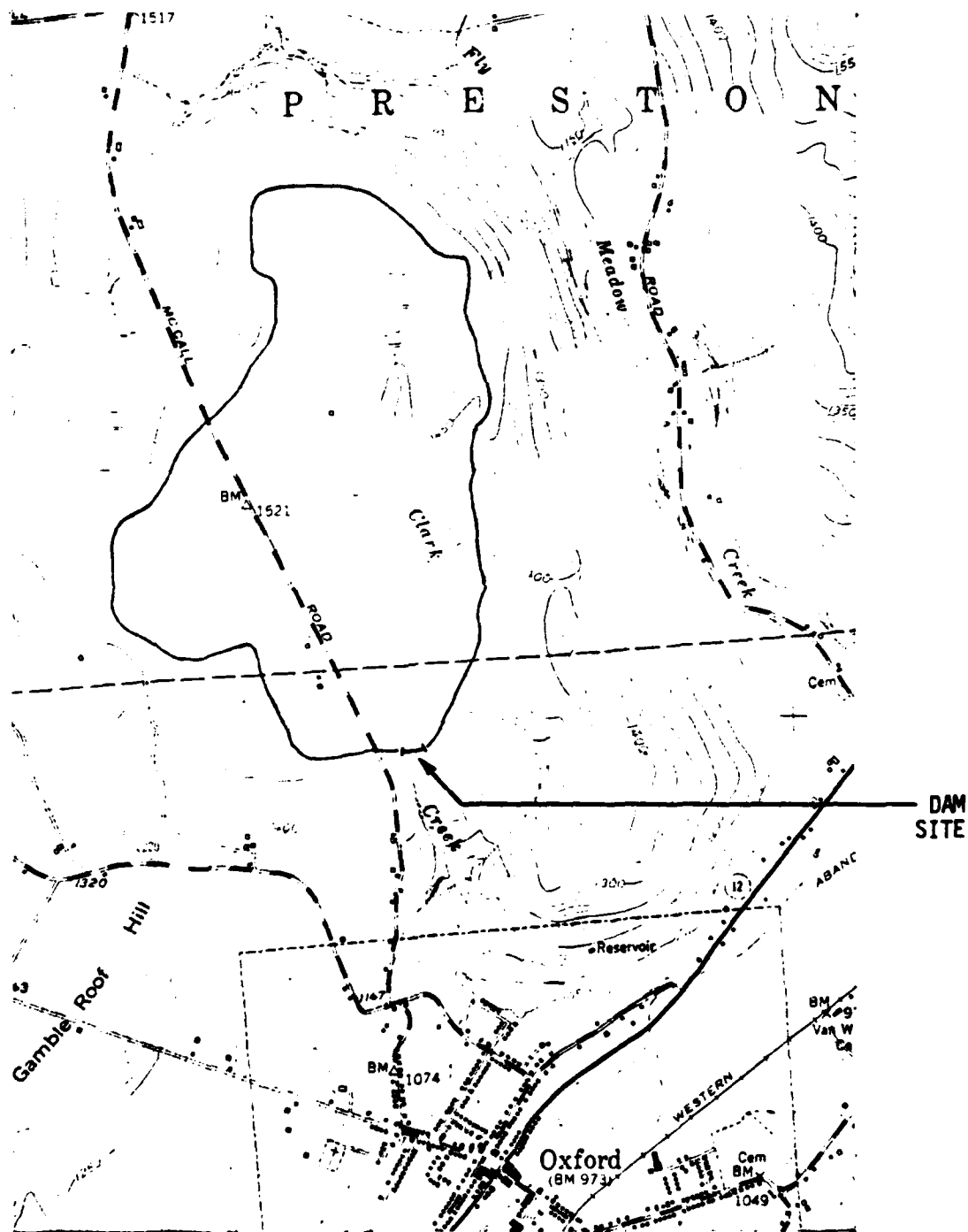
- 1) U.S. Department of Commerce; Weather Bureau;
Hydrometeorological Report No. 33 - Seasonal Variation of the Probable
Maximum Precipitation East of the 105th Meridian for Areas from 10 to
1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.
- 2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition,
McGraw-Hill, 1963.
- 3) University of the State of New York, Geology of New York, Education
Leaflet 20, Reprinted 1973.
- 4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.
- 5) U.S. Department of the Interior, Bureau of Reclamations;
Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

DRAWINGS



VICINITY MAP
CLARK'S CREEK WATERSHED PROJECT
SITE 1
NY-718



TOPOGRAPHIC MAP
CLARK'S CREEK WATERSHED PROJECT
SITE I
NY-718

CONSTRUCTION DETAILS

1. Areas under the dam (including 15 feet outside the toes) emergency spillway (including 15 feet outside the cut slopes) and borrow areas to be cleared and grubbed limits of areas to be cleared and grubbed to be staked in the field by the engineer.
2. The waste area and the area upstream from the dam and below elevation 1337.1 shall be cleared. Limits of area to be cleared will be staked in the field by the engineer.
3. Bottom section of emergency spillway to be covered with 6" of topsoil from STA. 6+00 to approx. STA. 7+76.
4. Waste areas shall be graded to be free draining & generally smooth. The maximum fill height shall be 5' unless otherwise approved by the engineer.

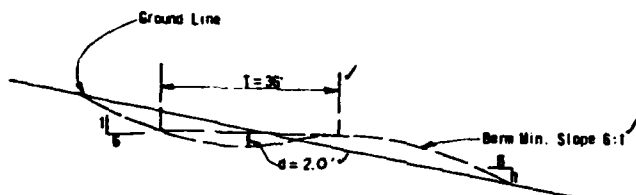
BORROW AREA

- a) Limits of borrow area are approximate and final location to be determined by the engineer in the field at the time of construction.
- b) Excavation will not be any closer than 90' feet from the upstream toe slope of dam and no lower than elevation 1329.0.
- c) The side slopes of borrow area will not be steeper than 1 vert to 3 horiz. from intersection of natural ground and top of cut to elevation 1335.1 to slope of 1 foot to 2 feet to intersection of bottom of pool.
- d) Bottom of pool slope will not be less than 1% from elevation 1329.0 to intersection of 3% slope.
- e) At the completion of earth fill operations, the borrow areas above elevation 1335.1 shall be left gently sloping, generally smooth, and free draining.

DIVERSION #1

CONSTRUCTION DETAILS

1. Minimum depth of cut & of ditch to be 2' or as determined in the field by the engineer at the time of construction.
2. The grades as stated are only approx. The final location and finished grades will be established in the field by the engineer at time of construction.



TYPICAL SECTION DIVERSION NO. 1

Center Line Profile Grades Vary

0+00 to 2+50	0+00 to 2+50 - 4.0% Grade
2+50 to 4+50	2+50 to 4+50 - 1.8% Grade
4+50 to 8+30	4+50 to 8+30 - 0.9% Grade

DIVERSION = 830 L.F.

CLEARING = 0.6Ac.

MOD. "1-1/2" CLEAR-GRUB = 5.5Ac.

SEEDING = 15.9Ac.

BENCH MARK DESCRIPTION

W. MON. BRASS CAP IN 3" CONCRETE POST
ELEV. 1372.42
S OF DAM STA. 0+14.36
W. OF McALL ROAD

CENTER MON. BRASS CAP IN 3" CONCRETE POST
ELEV. 1317.01
LEFT SIDE OF OUTLET CHANNEL
362.94' BEYOND STA. 8+23 ON LINE W/ LEFT LEG OF DAM

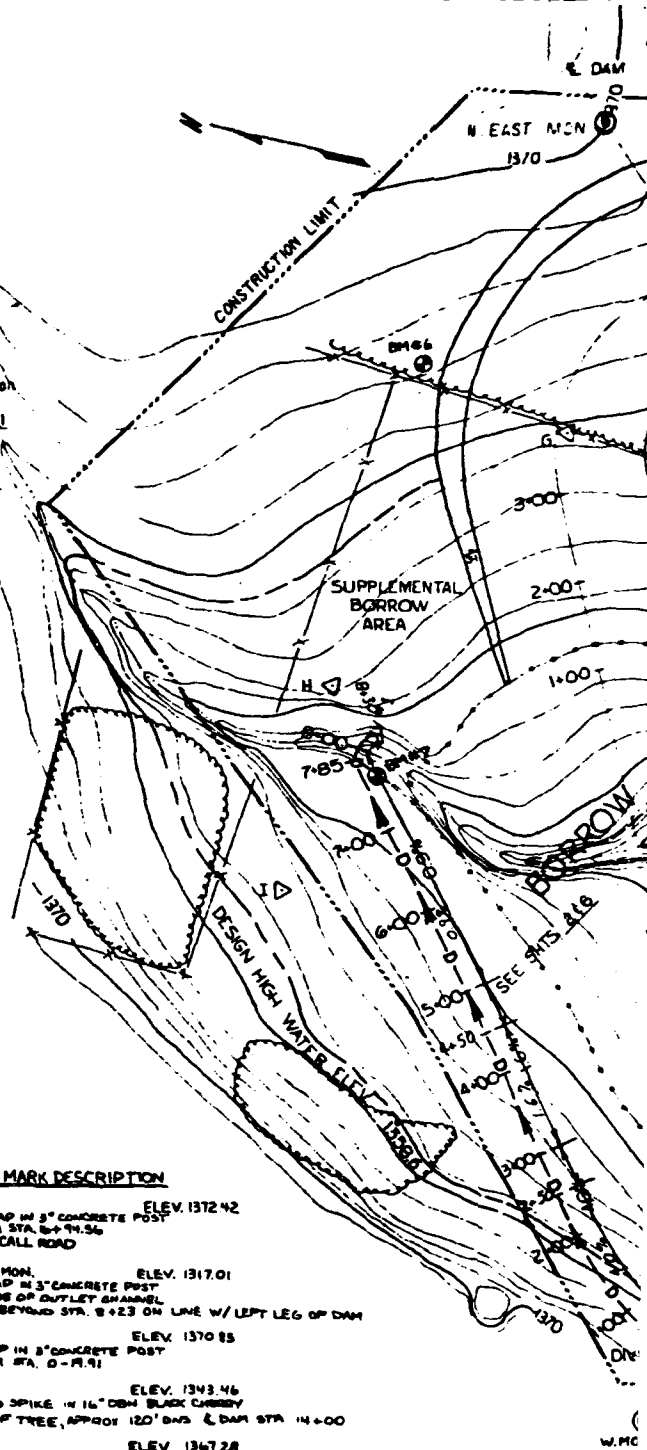
N.E. MON. BRASS CAP IN 3" CONCRETE POST
ELEV. 1370.85
S OF DAM STA. 0+14.91

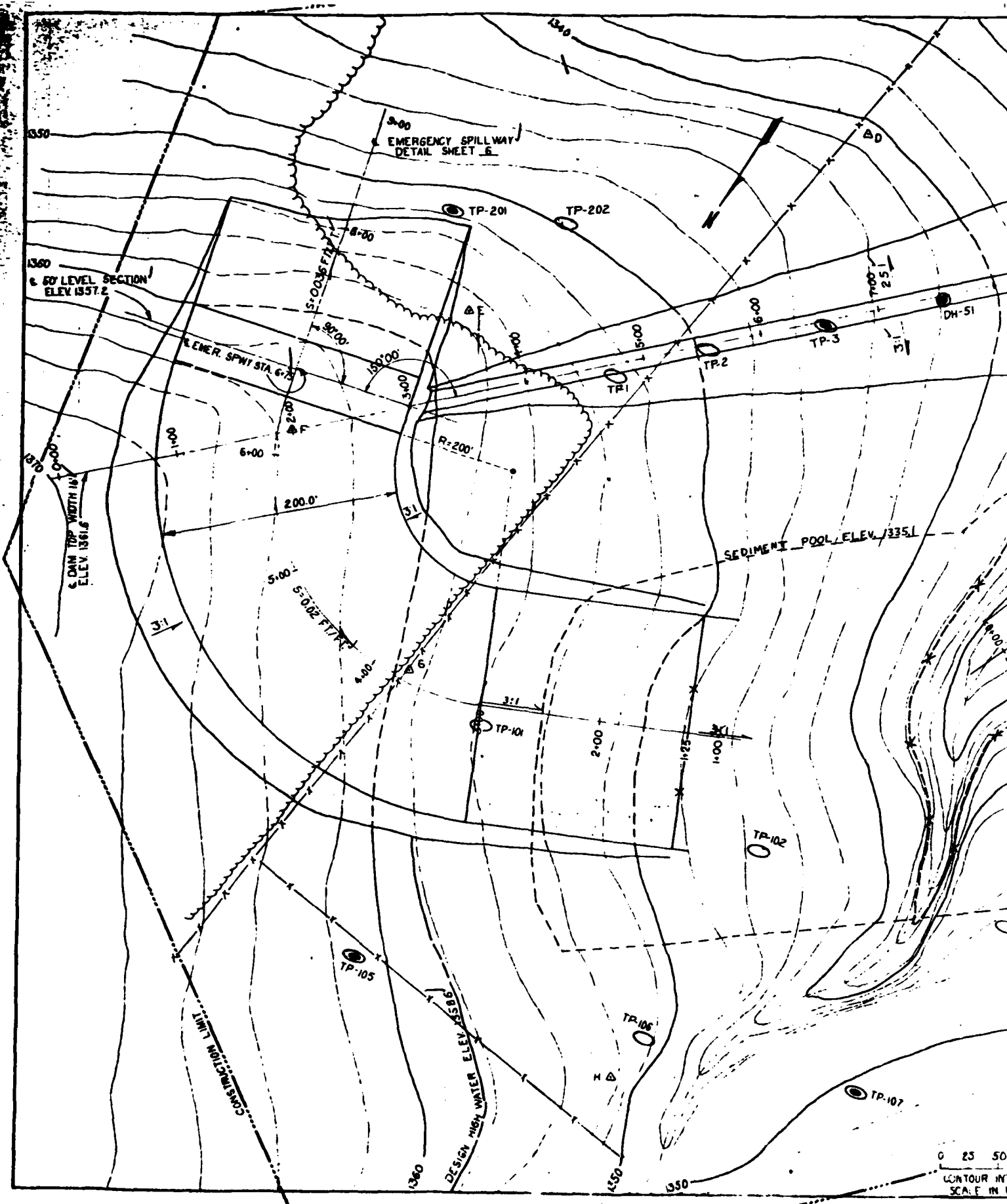
BM #1 RAILROAD SPIKE IN 16" DBM BLACK CHERRY
ELEV. 1343.46
N. SIDE OF TREE, APPROX. 120' DWS. & DAM STA. 14+00

BM #6 RAILROAD SPIKE IN 16" DBM OAK, E. SIDE OF TREE
ELEV. 1367.28
TREE IN FENCE LINE APPROX. 175' DWS. EMER. SPAN STA. 14+00

BM #7 RAILROAD SPIKE IN 20" DBM ELM
ELEV. 1350.38
UPSTREAM END OF BORROW AREA, NEAR OUTLET OF DIVERSION

BM #12 BRASS CAP IN CENTER OF TOP DECK OF RISER
ELEV. 1357.82

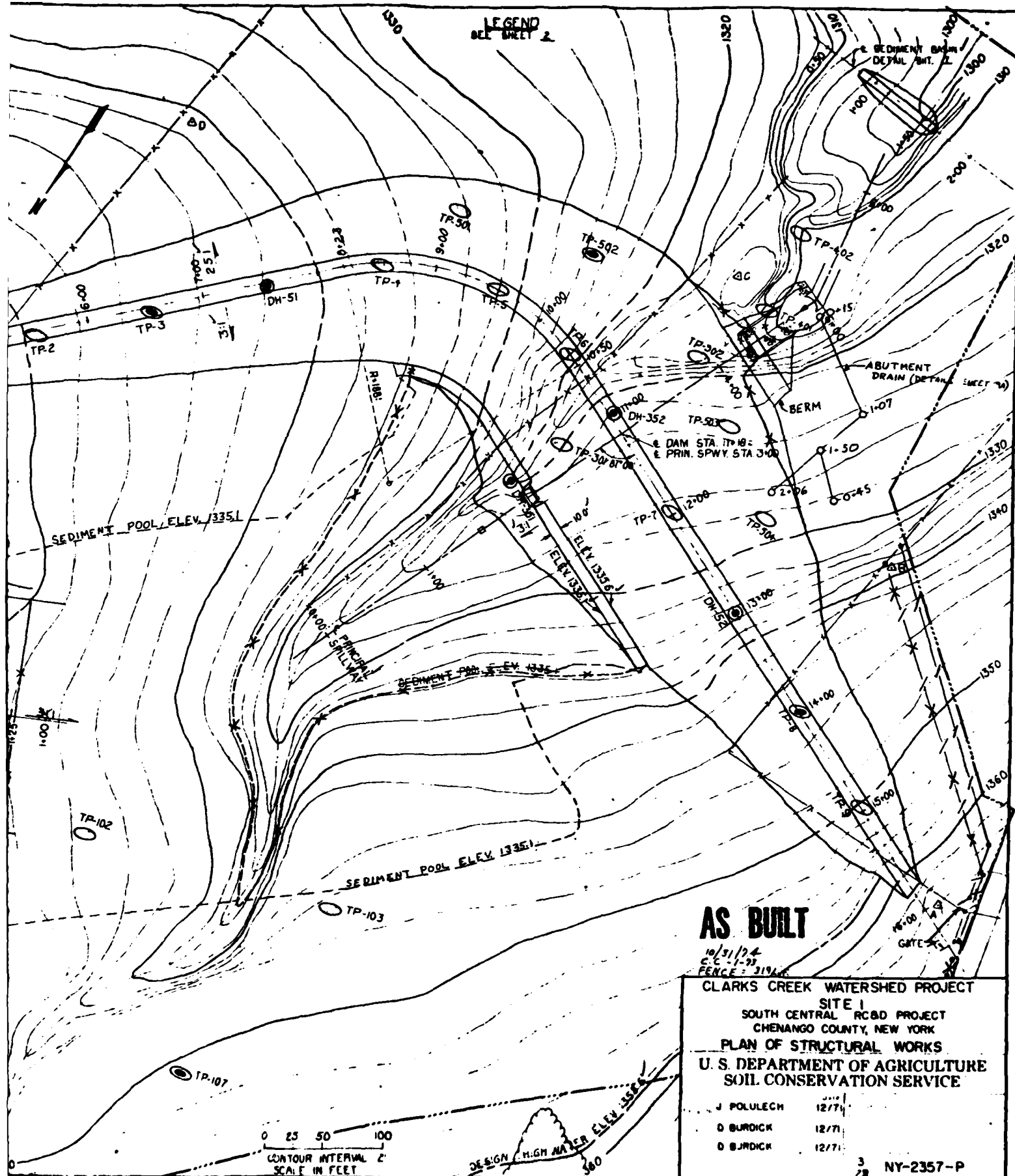




2

0 25 50
CONTOUR IN
SCALE IN 1

LEGEND
SEE SHEET 2



AS BUILT

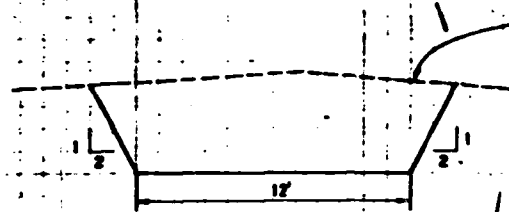
10/31/74
S.C. - 1-75
PERCE = 3194

CLARK'S CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
PLAN OF STRUCTURAL WORKS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

J. POLULECH	12/71
D. BURDICK	12/71
D. BURDICK	12/71

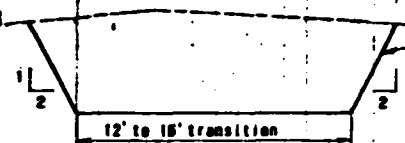
3
28 NY-2357-P

1 2



SECTION OF CUTOFF TRENCH AT STA. 5+00

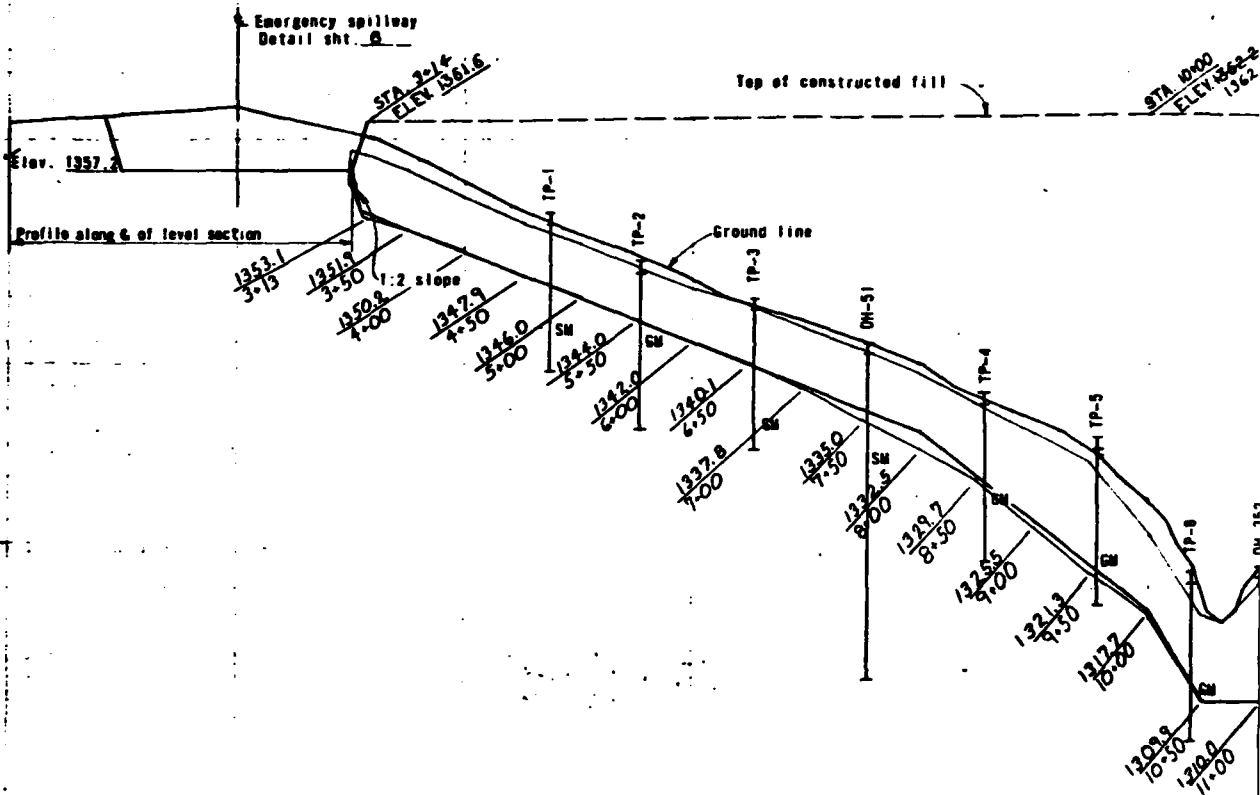
Typical from approx. sta. 3+13 to sta. 10+00 and from sta. 12+50 to approx. sta. 16+00. 13+07



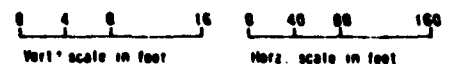
SECTION OF CUTOFF TRENCH AT STA. 11+25

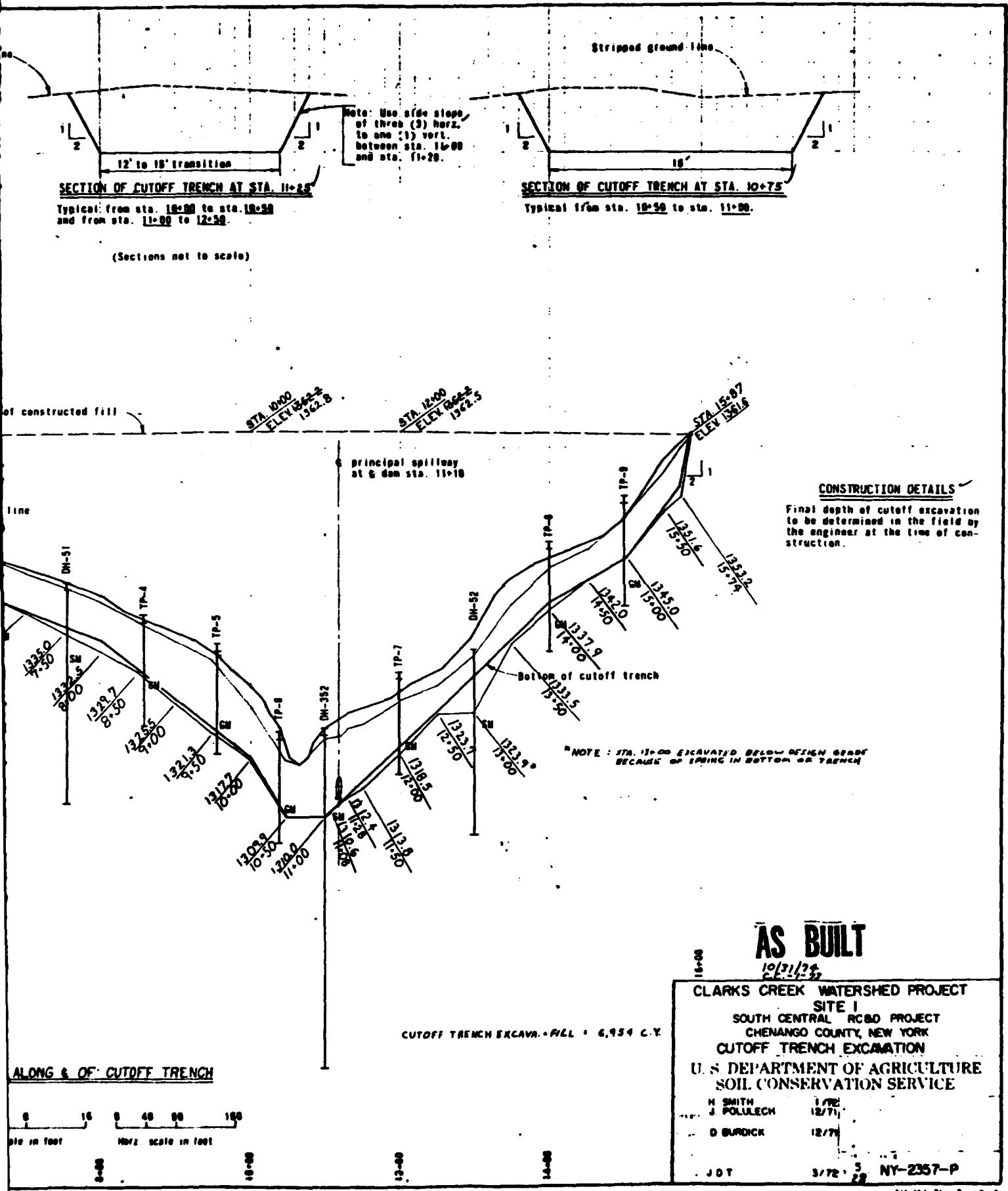
Typical from sta. 10+00 to sta. 12+50 and from sta. 11+00 to 12+50.

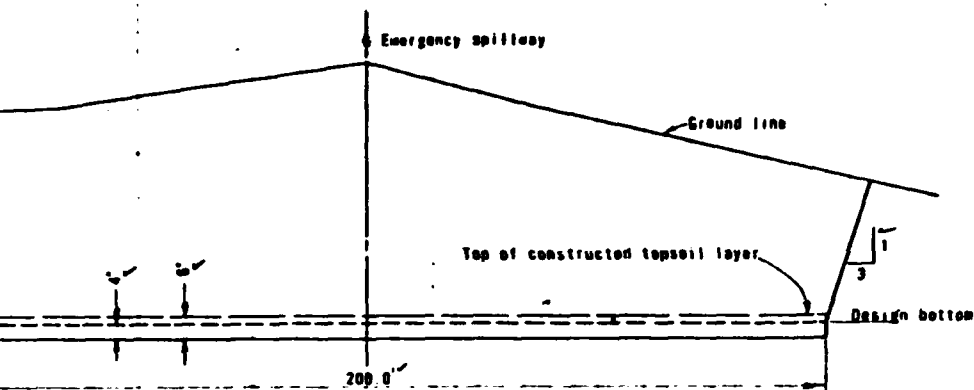
(Sections not to scale)



PROFILE ALONG & OF CUTOFF TRENCH

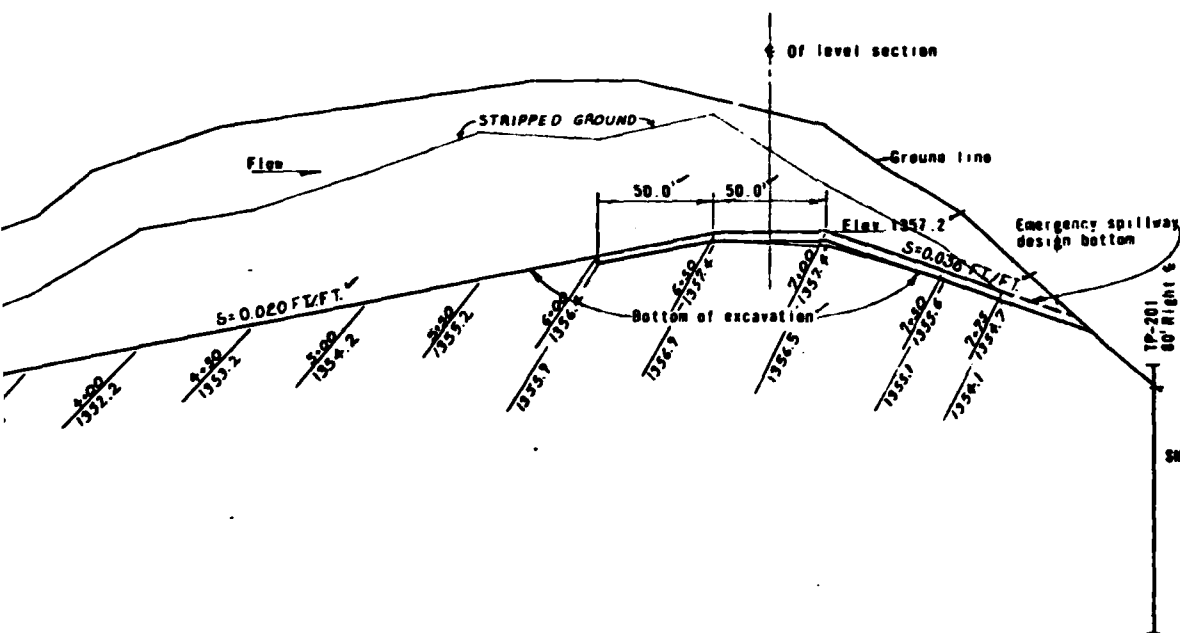
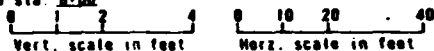






SECTION OF EMERGENCY SPILLWAY @ STA. 6+75

Typical from sta. 8+00 to approximately sta. 6+253.75. Excavation limits to design bottom from approximately sta. 4+253.00 to sta. 8+00.



PROFILE ALONG & OF EMERGENCY SPILLWAY



TOPSOIL IN EMER SPWT = 390235

AS BUILT

10/31/74
C.C.-1-23

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHEMANGO COUNTY, NEW YORK
EMERGENCY SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Prepared by	J. POLULECH	Date	12/77
Checked by	D. BURDICK	Date	12/77
Project No.			NY-2357-P

523 (106-776) (Rev. 2-69)

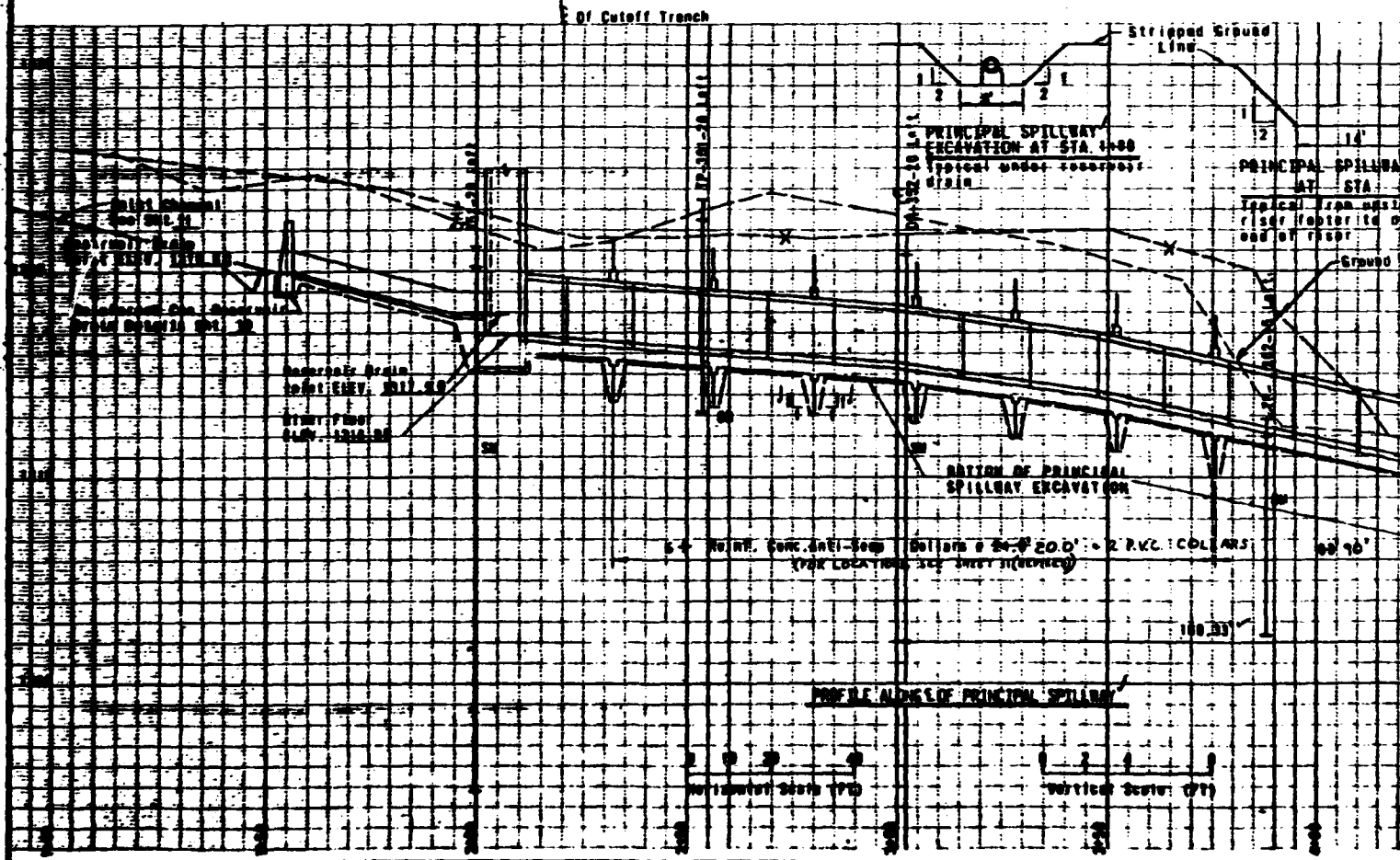
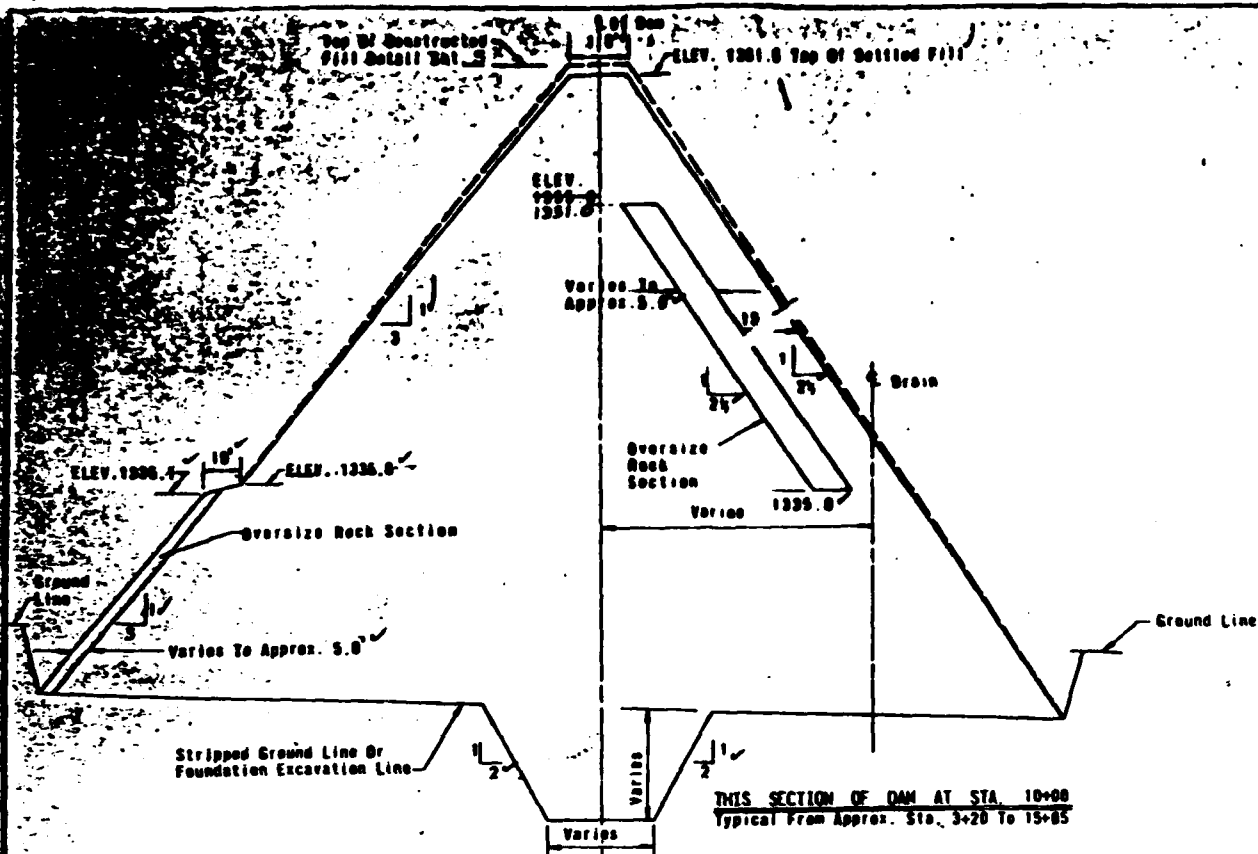
2 - 1 - 2

GLACIAL
TP-105
TP-201
TP-3

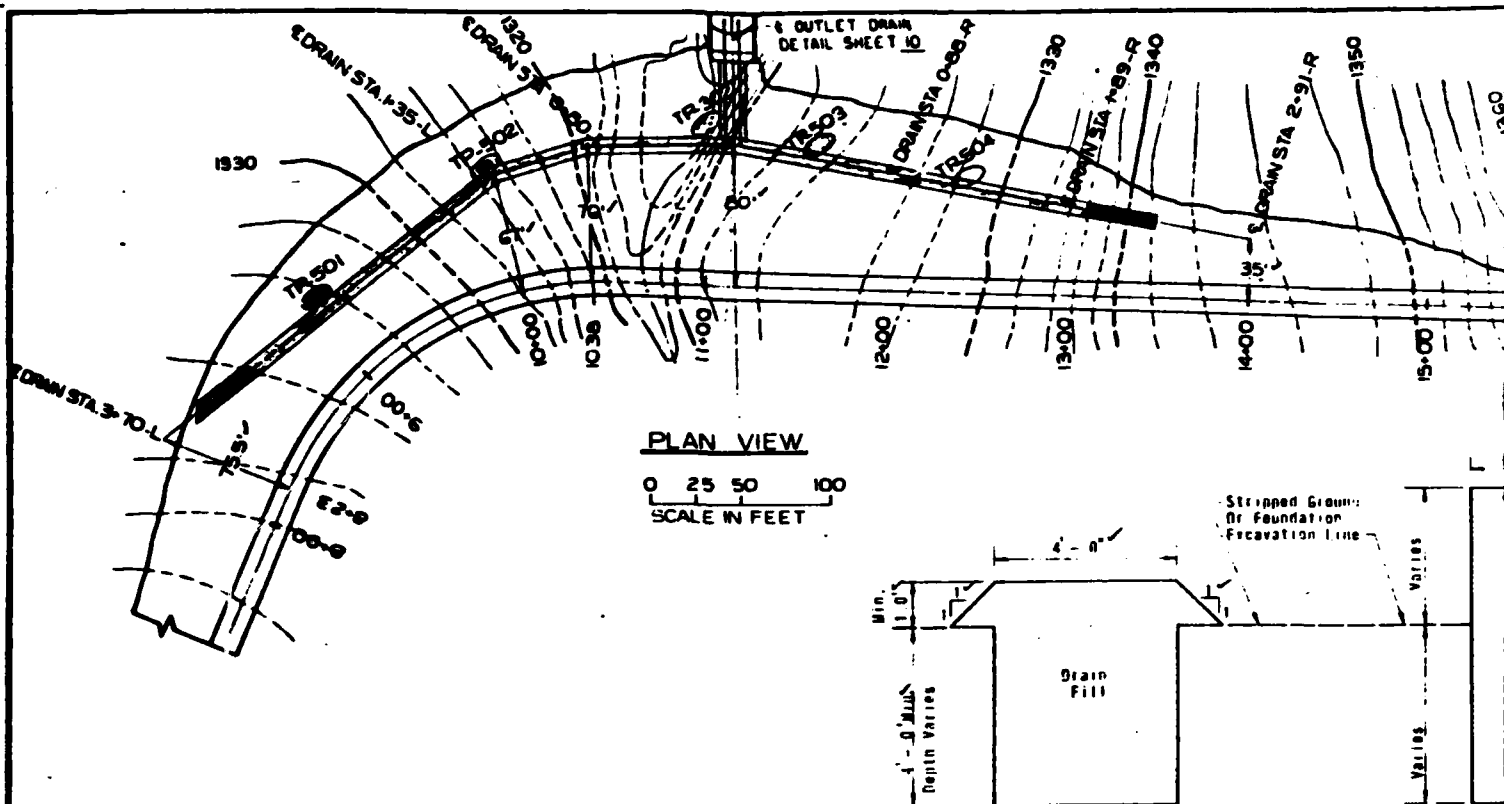
J₁ The
J₂ a.)
"sha
b.)
dam
J₃ Max
J₄ sha
J₅ Wate
a.)
b.)
cont
pres
be c

J₁ Over
J₂ aval
J₃ Mate
J₄ fill
J₅ abov
Tops
inco
be w

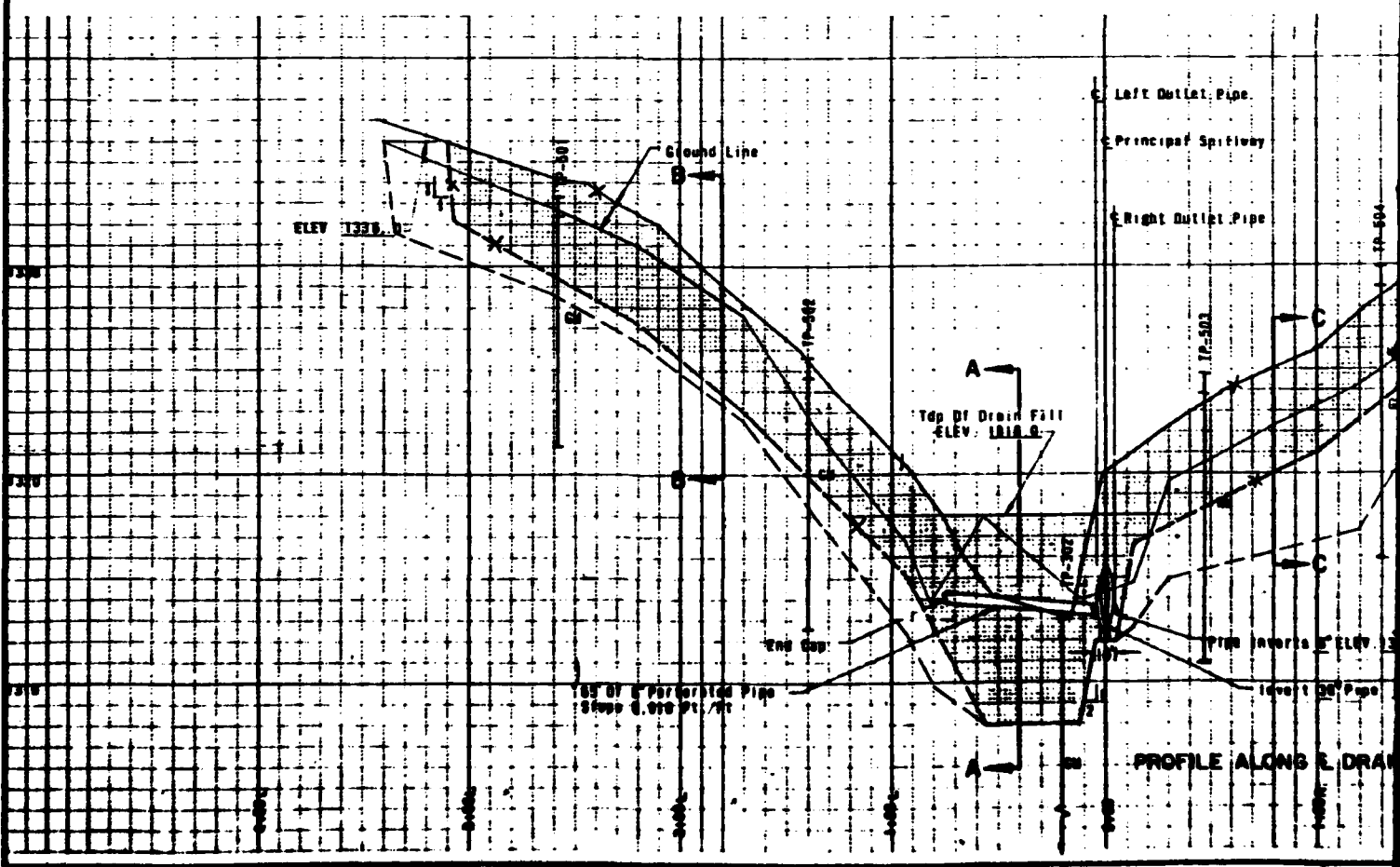
J₁ The
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J₃ at ti

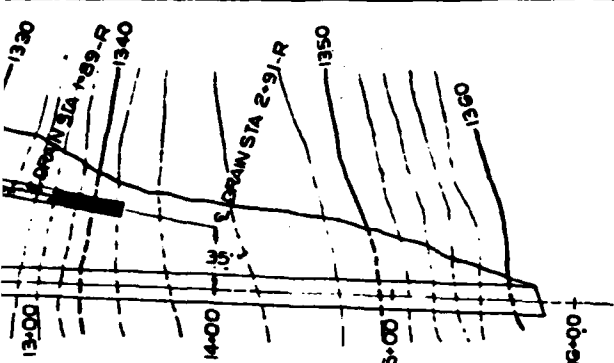


1



SECTION B-B C-C





DRAINAGE SYSTEM DETAILS

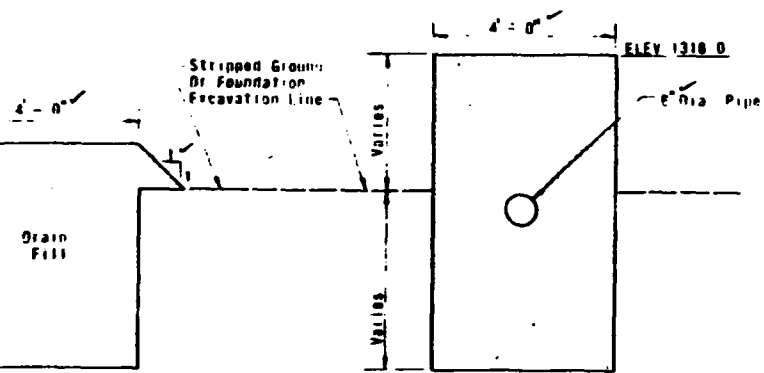
- ✓ Asbestos Cement Drain Pipe Shall Conform To Material Spec. 545 and Shall Be 6" Dia Pressure Pipe, Class 200
- ✓ The Bottom Profiles Elev. Of All Excavation as Shown Are Only Approx. The required finished Grades will Be Established in The Field At The Time Of Construction By The Engineer.

QUANTITY SUMMARY

607	Cu. Yds. Of Drain Fill
143	Lin. Ft. Of Straight Section Of 6" Perforated Asbestos Cement Pipe.
2	End Caps
1	90° 6" Cast Iron (External Angle) Elbow
42	Lin. Ft. Of Straight Section Of 6" Non-Perforated Asbestos Cement Pipe.

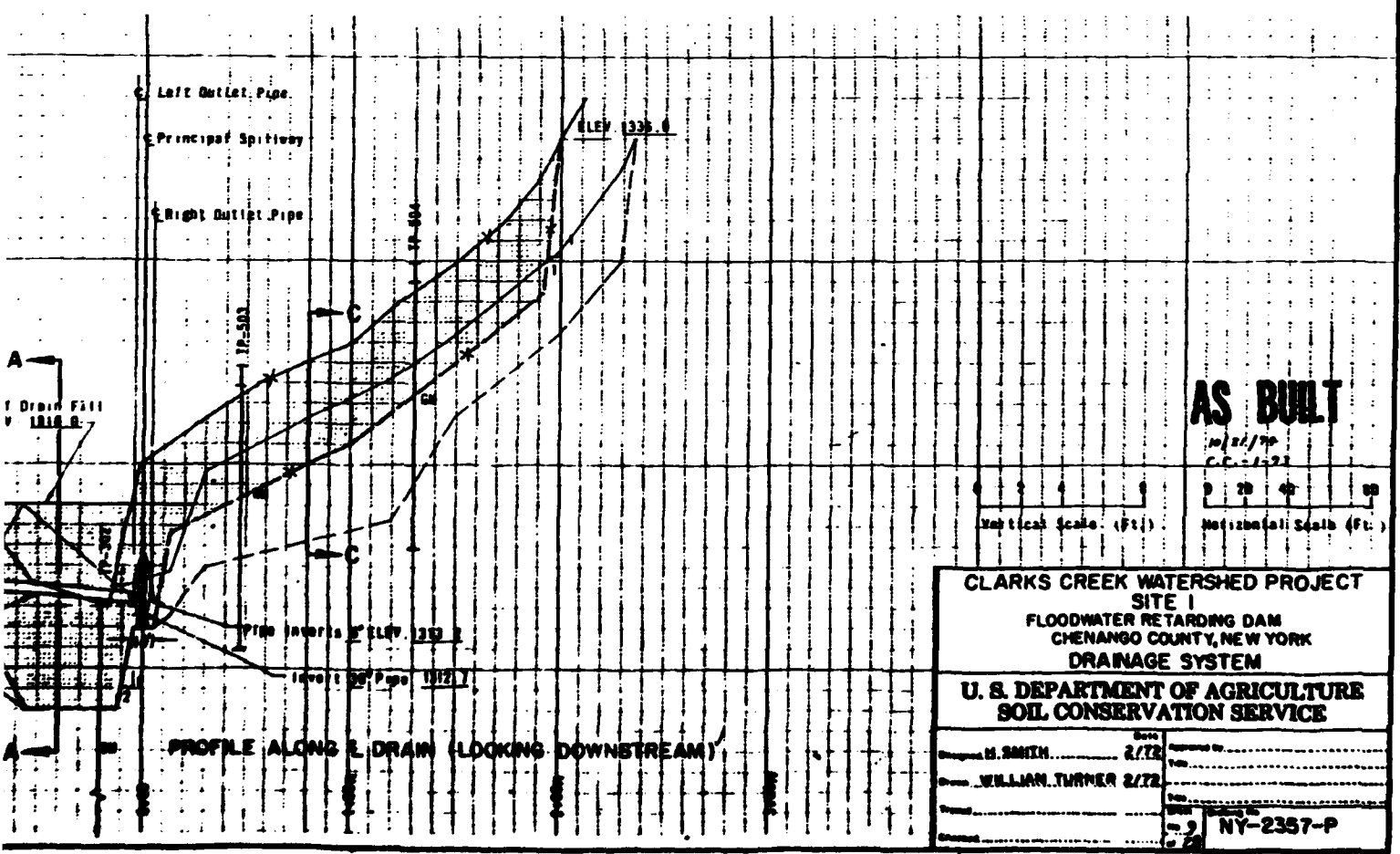
GRAIN SIZE DISTRIBUTION FOR DRAIN FILL

Drain fill shall meet the gradation of screening #1 of the standard gradations from the January 2, 1967 New York Public Works Specifications. In addition, the percentage of material in the drain fill finer than a #200 sieve shall not be more than three (3) percent.



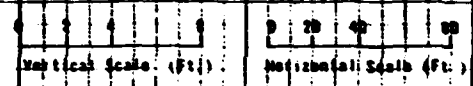
TILLN B-6 CC

SECTION A-A



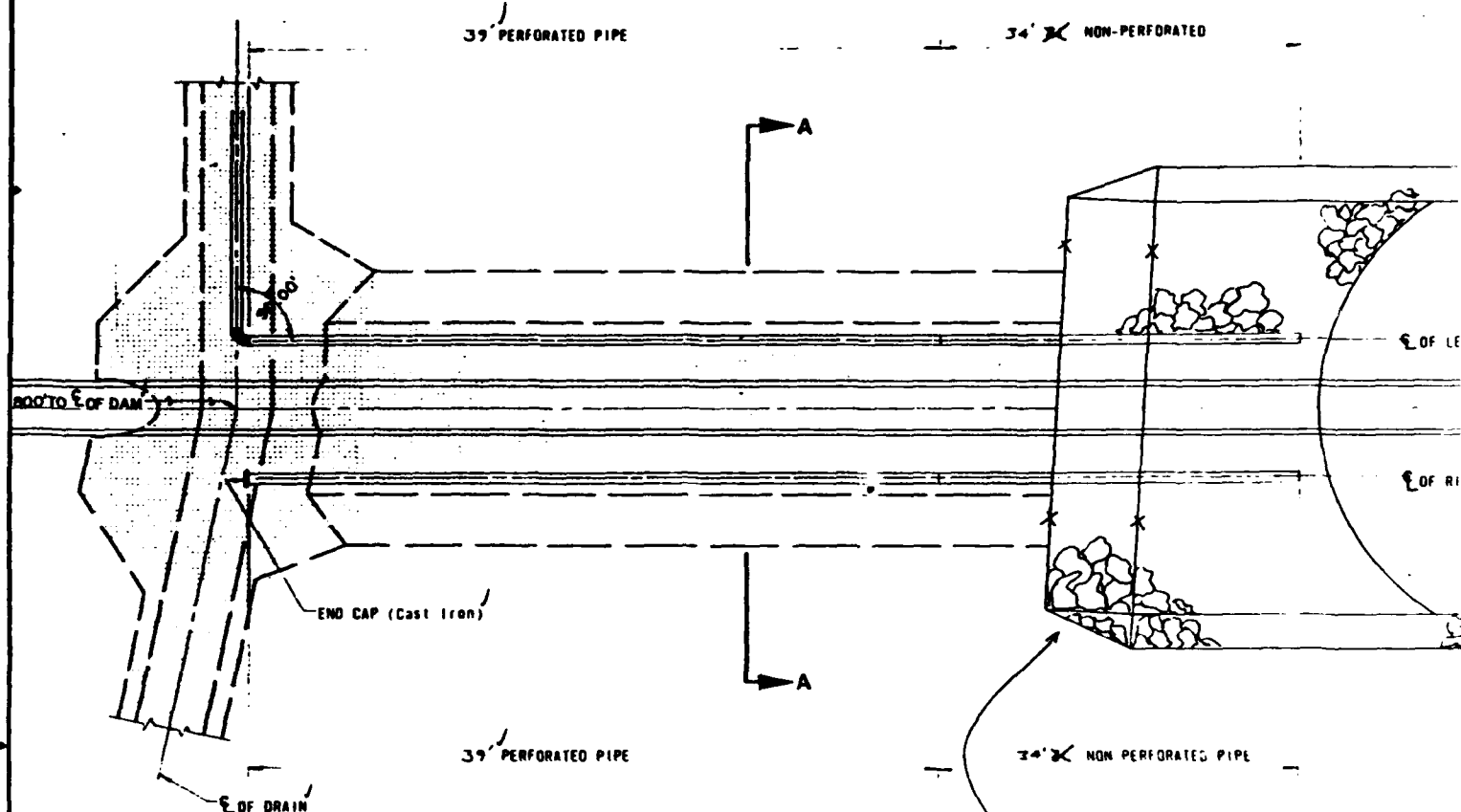
AS BUILT

10/21/79
C.C.-1-22

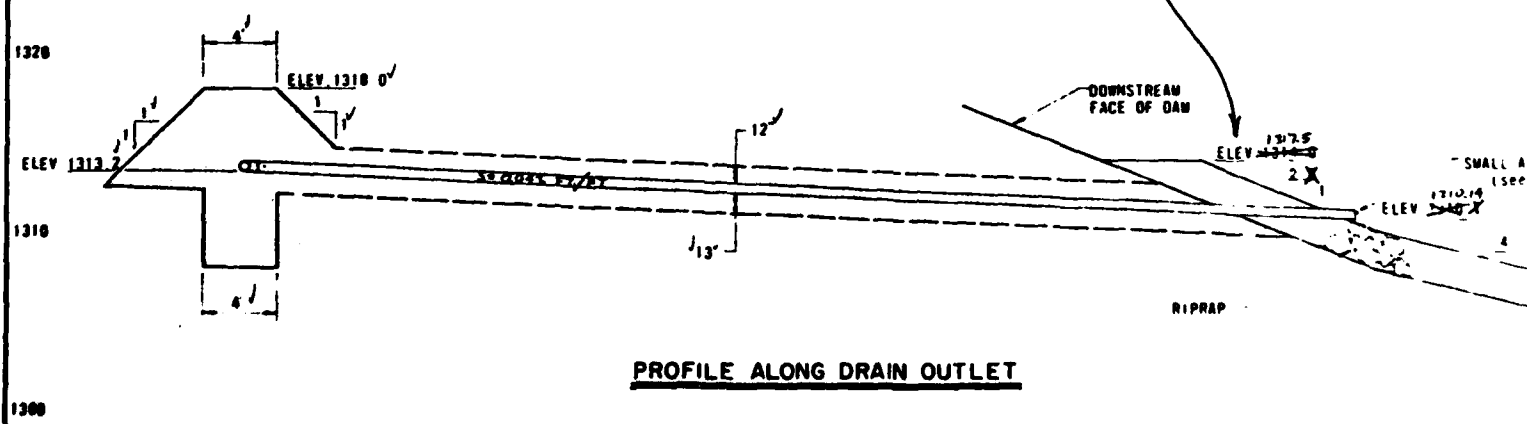


CLARKS CREEK WATERSHED PROJECT SITE I FLOODWATER RETARDING DAM CHENANGO COUNTY, NEW YORK DRAINAGE SYSTEM	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Drawn by W. SMITH	2/72
Checked by WILLIAM TURNER	2/72
Project No. NY-2357-P	Sheet No. 2

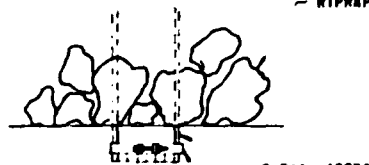
11 1 2



0 5 10
(Scale in Feet)



3/4" X NON-PERFORATED



6 DIA ASBESTOS CEMENT PIPE

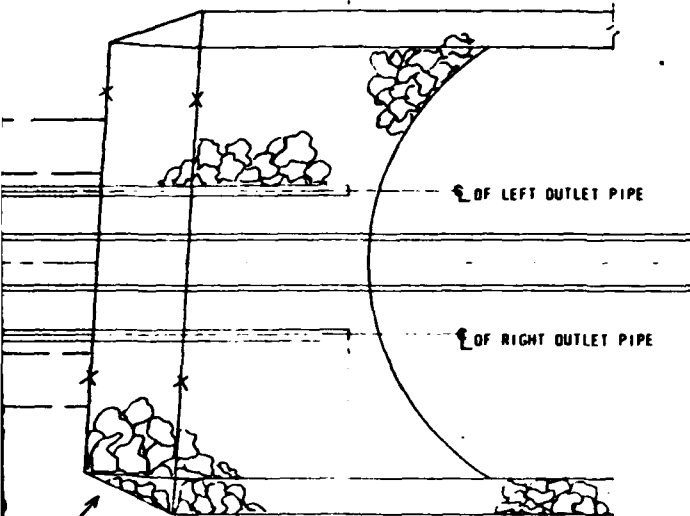
GALVANIZED CLAMP 1' 6" x 1' x 28"

1/4" DIA GALV BOLT -
FLAT WASHER 1 1/2"
LONG

1' X 1' WOVEN WIRE MESH
GALVANIZED NO 12 GAGE



SMALL ANIMAL GUARD DETAILS (2-Required)



3/4" X NON PERFORATED PIPE

RIPRAP REVISED IN THIS AREA.
DETAILS ON SHEET 10A.

DOWNSTREAM
FACE OF DAM

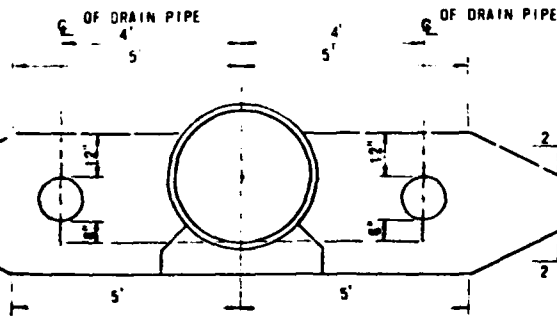
ELEV 1275
2 X

SMALL ANIMAL GUARD
(see details)

ELEV 1210.10
2 X

RIPRAP

OF PRINCIPAL SPILLWAY



SECTION A-A
(Not To Scale)

AS BUILT

10/31/76
C.C. 1-73

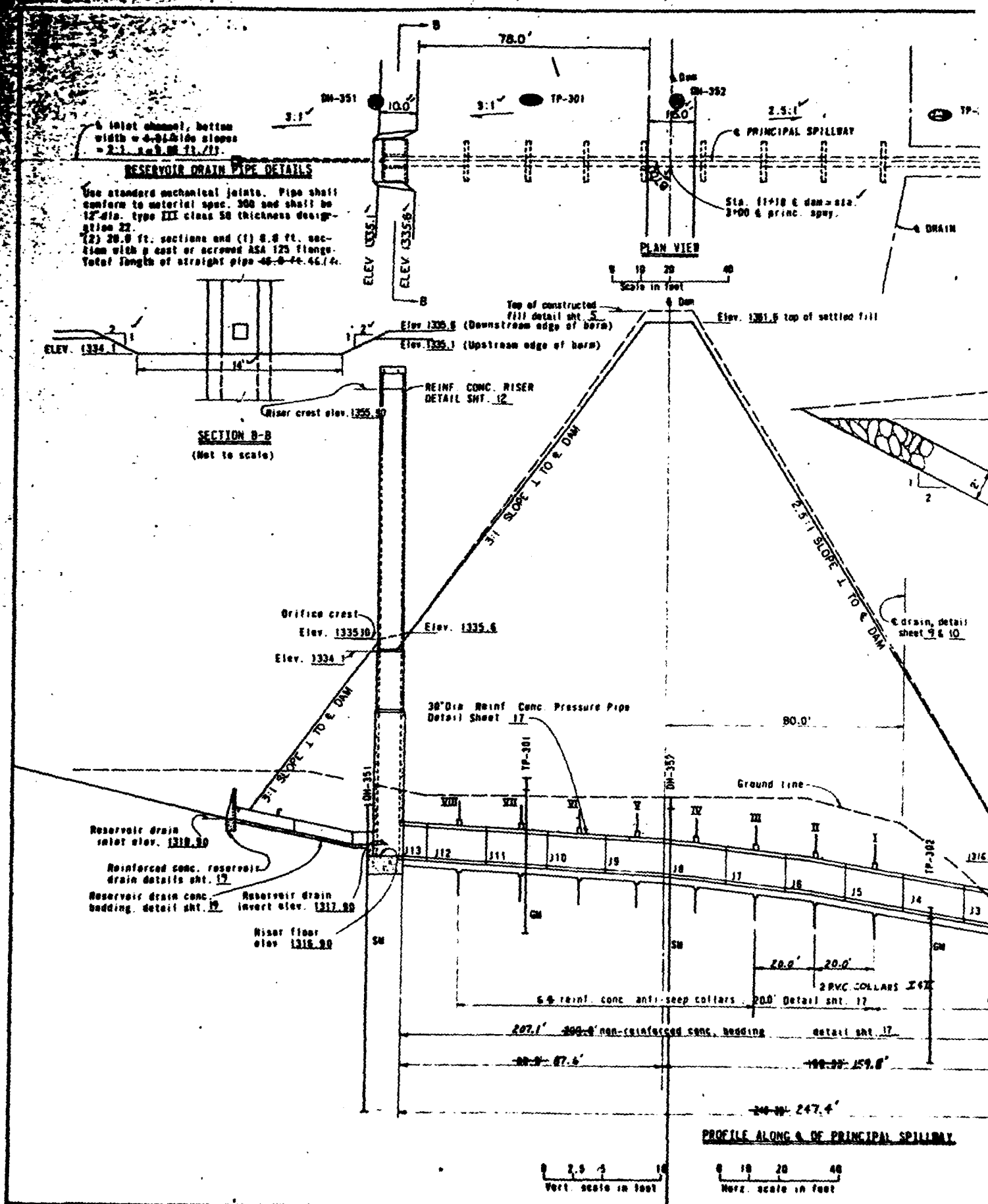
CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
DRAINAGE SYSTEM
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

HOWARD SMITH 3/72
ROYLTON 3/72
WILLIAM M TURNER 3/72

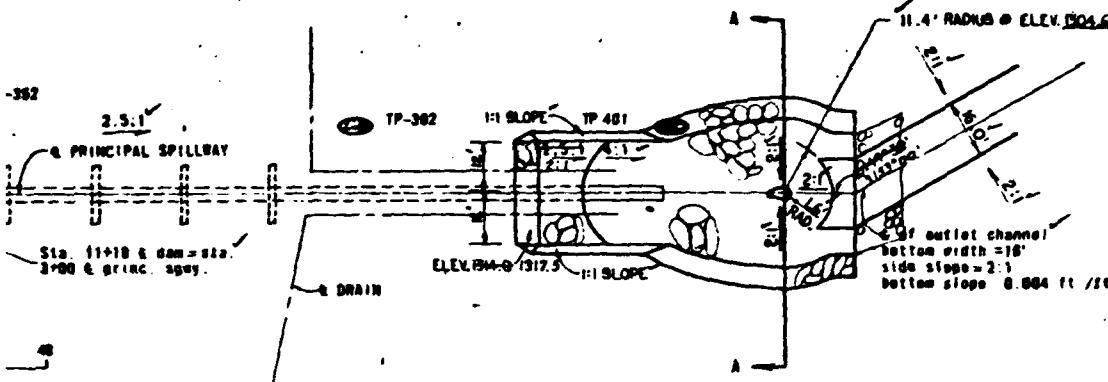
NY-2357-P

NO. 111 B Rev. 7-66

1 - 2



-392



JOINT	DIST FROM OUTLET	INVERT OF 30 DIA PIPE	SLOPE FT/FT
Outlet	0	1300.44	0.0371
J-1	20	1310.189	
2	40	1310.92	
3	60	1311.67	
4	80	1312.41	
5	100	1313.196	
6	120	1313.894	
7	140	1314.634	
8	160	1315.17	0.0278
9	180	1315.773	
10	200	1316.296	
11	220	1316.523	0.0135
12	240	1316.79	
13	260	1316.90	

Above dimensions for lengths of pipe are based on nominal lengths and do not include creep

COLLAR	DIST FROM OUTLET	INVERT OF 30 DIA PIPE
I	90	1312.78
II	110	1313.52
III	130	1314.26
IV	150	1314.90
V	170	1315.44
VI	190	1315.98
VII	210	1316.38
VIII	230	1316.65

30" reinforced concrete pipe See detail sheet 17

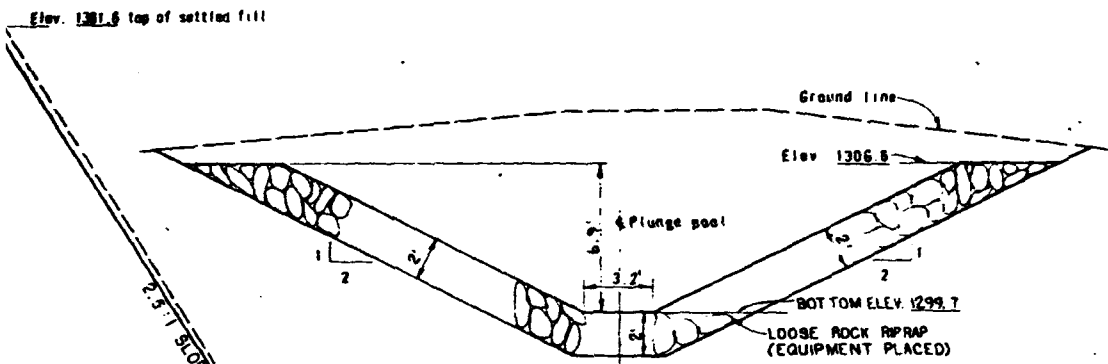
When pipe supplied is in lengths other than shown the engineer will provide the contractor with a revision of the above tables

REINF CONC PRESSURE PIPE 30" DIA 24THUR CAST IRON PIPE

LOOSE ROCK RIP RAP 1/4 CY

MOQ 5-8/22/74 - P.V.C. COLLARS - 2

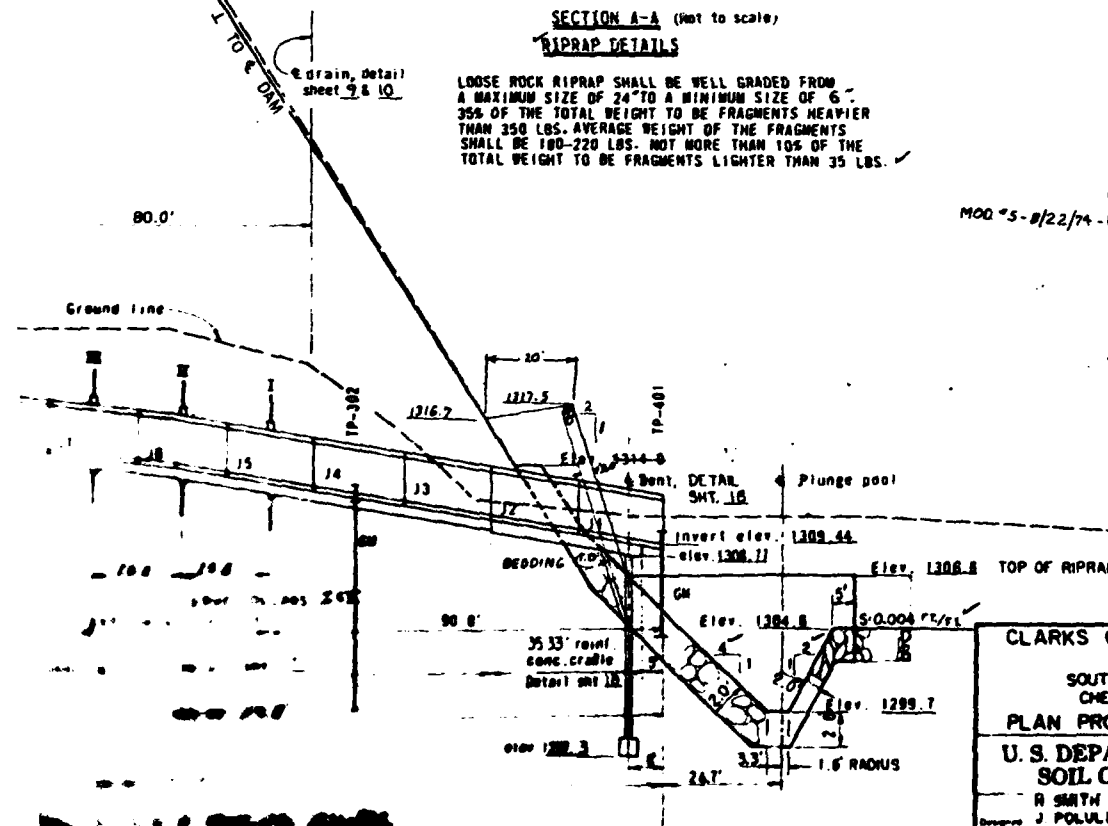
1 JOB



SECTION A-A (Not to scale)

RIPRAP DETAILS

LOOSE ROCK RIPRAP SHALL BE WELL GRADED FROM A MAXIMUM SIZE OF 24" TO A MINIMUM SIZE OF 6". 35% OF THE TOTAL WEIGHT TO BE FRAGMENTS HEAVIER THAN 350 LBS. AVERAGE WEIGHT OF THE FRAGMENTS SHALL BE 100-220 LBS. NOT MORE THAN 10% OF THE TOTAL WEIGHT TO BE FRAGMENTS LIGHTER THAN 35 LBS.



AS BUILT

10/31/74
C.C.-1-73

CLARKS CREEK WATERSHED PROJECT
SITE 1

SOUTH CENTRAL RCSD PROJECT
CHENANGO COUNTY, NEW YORK

PLAN PROFILE OF PRINCIPAL SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

R SMITH
J POLULECH
D BURDICK

1/78
1/78

1/78
1/78

NY-2357-P

CONTRACT MODIFICATION
5-8/11/72





1/4" x 6" Carbon steel plate,
to conform to Spec 581
Continuous thru constr. joint.
Splices Shall Be Either:
1. Butt Welded
2 Lapped 3" And Bolted
3 Lapped 3" And Fillet Welded

→ A
2-6

PLATE
CONSTR. JOINT

Low stage crest
elev 1335.10

1-0

1-3

Reservoir drain
invert elev
A317 90
Riser 1998
elev 1376 90

7-6
12-0
L → 2
ELEVATION

			234	Lbs.
			6477	Lbs.
			3155	Lbs.
			777	Lbs.
			8543	Lbs. ✓

Bars A2).
Bars R1, R3, R4 and R5)
• $\frac{16}{100} \times 42.32 = 6.7712$ Cu. Yds

Mark	Size	Quantity	Length	Type	B	C	Total Length	Mark	Size	Quantity	Length	Type	B	C	Total Length
B1	#6	12	9-6	1			114-0	A30	#3	20	8-0	21	2-9	5-3	160-0
B2	#6	10	11-6	1			115-0								
B3	#7	30	10-0	21	3-3	6-7	380-0								
B4	#6	10	11-6	1			115-0								
B5	#6	12	9-6	1			114-0								
B6	#6	2	4-0	1			8-0								
B7	#6	6	7-6	21	1-0	6-6	45-0								
B8	#6	19	7-6	21	1-0	6-6	142-6								
B9	#5	14	8-6	1			119-0								
B10	#6	3	3-6	1			17-6								
B11	#6	3	2-9	1			8-3	T1	#5	18	6-0	1			108-0
B12	#6	2	2-9	1			5-6	T2	#5	6	8-0	1			48-0
B13	#6	10	6-9	21	0-10	5-11	67-6	T3	#5	4	4-9	1			19-0
B14	#6	18	9-3	21	3-4	5-11	166-6	T4	#5	4	3-6	1			14-0
								T5	#5	4	2-3	1			3-0
								T6	#5	4	9-0	19	2-0	7-0	36-0
								T7	#5	12	8-3	1			99-0
								T8	#5	2	3-3	1			6-6
								T9	#5	2	5-9	1			11-6
								T10	#5	2	10-9	1			21-6
								T11	#5	2	13-3	1			26-6
								T12	#5	14	6-3	1			87-6
								T13	#5	6	8-0	1			48-0
A1	#6	22	10-9	1			236-6	T14	#5	4	6-0	1			24-0
R2	#5	18	8-6	1			136-0	T15	#5	4	4-9	1			19-0
R3	#6	8	3-6	1			28-0	T16	#5	4	3-6	1			14-0
R4	#6	28	8-6	1			238-0	T17	#5	4	2-3	1			9-0
R5	#6	32	9-3	21	3-4	5-11	296-0	T18	#5	4	9-0	19	2-0	7-0	36-0
R6	#6	14	8-6	1			119-0	T19	#5	24	8-0	21	2-9	5-3	192-0
R7	#6	10	3-6	1			35-0	T20	#5	2	3-3	1			6-6
R8	#6	26	4-0	1			104-0	T21	#5	2	5-9	1			11-6
R9	#5	36	8-9	21	3-14	5-74	315-0	T22	#5	2	8-3	1			16-6
R10	#5	4	8-3	21	2-0	5-4	33-0	T23	#5	2	10-9	1			21-6
R11	#5	22	6-9	1			148-6	T24	#5	2	13-3	1			26-6
R12	#6	14	8-3	1			115-6	T25	#5	4	13-9	1			55-0
R13	#5	10	3-6	1			35-0	T26	#5	4	13-9	1			55-0
R14	#5	26	4-6	1			117-0	T27	#4	14	8-3	1			115-6
R15	#5	20	3-8	1			73-4	T28	#6	2	4-9	1			9-6
R16	#5	36	8-3	21	2-10	5-4	297-0	T29	#4	7	13-9	1			96-3
R17	#5	4	8-0	21	2-9	5-3	32-0								

BAR TYPES

AS BUILT

10/31/74
CC - 1-73

STAR

TYPE . I

TYPE 19

TYPE 28

BLOCKED IN DIMENSIONS ARE NOT TO SCALE

0 2 4 6
Scale in Feet

CONSTRUCTION DETAILS

- 1 Bar dimensions are out to out of bar.
- 2 Radius of bends equals 3 bar diameters for sizes equal to or less than #7.
- 3 The #2 and #3 dimensions from face of concrete to steel are clear distances.

Where not otherwise specified all reinforcing steel placed in concrete poured against the ground shall have a minimum of 3" cover. All reinforcing steel placed in concrete poured in forms shall have a minimum of 2" cover.

- 4 All exposed edges of concrete to have 1/4" chamfer unless otherwise noted

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC BD PROJECT
CHENANGO COUNTY, NEW YORK
RISER STRUCTURAL DETAILS

**U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

Adapted by	J. POLULECH	Date	
Written by	D BUDICK	1/72	
Produced by			
Directed by			
Casting By			
Costume Designer			
Music By			
Production Office			
NY-2357-P			

CLARK CREEK

TEST PIT LOGS

TP 01, E of Dam, 6/22/71, NM, 1353.0

0.0 - 1.0 Topsoil
 1.0 - 14.0 Sand, silty
 Max. size 18", varied lithology w/sandstone boulders and shale flags;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 35% gravel, 35% sand, 45% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Boulders in bottom of pit.

TP 02, E of Dam, 5/17/71, NM, 1349.2

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, silty
 Max. size 18", varied lithology;
 Approx. 10 + 6", 20 3-6", 96% matrix (which is approx. 35% gravel, 35% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Slight seepage just below topsoil.

TP 03, E of Dam, 5/17/71, NM, 1345.8

0.0 - 1.0 Topsoil
 1.0 - 13.5 Gravel, silty
 Max. size 18" varied lithology;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).
 D. S. 33 @ 10.0', SM

NOTE: Refusal on boulders @ 13.5 ft.

TP 04, E of Dam, 5/17/71, NM, 1337.5

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, sandy
 Max. size 18", varied lithology;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 35% gravel, 35% sand, 30% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).

NOTE: Seepage @ 7.5 ft.

TP 05, E of Dam, 5/17/71, NM, 1333.6

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, silty
 Max. size 20", varied lithology w/shale flags and sandstone boulders;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

TP 06, E of Dam, 5/18/71, NM, 1321.5

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, silty
 Max. size 24", varied lithology w/shale flags and sandstone boulders;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).

TP 07, E of Dam, 5/18/71, NM, 1329.7

0.0 - 1.0 Topsoil
 1.0 - 14.0 Gravel, silty
 Max. size 18", varied lithology w/shale flags and sandstone boulders;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
 Brown; moist-wet; slight permeability; dense; homogeneous; glacial till; (GM).

NOTE: Heavy seepage @ 0.5 ft; banks of pit cave continuously.

TP 08, E of Dam, 5/17/71, NM, 1347.2

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, sandy
 Max. size 30", varied lithology w/shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 40% sand, 20% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)
 D. S. 0.1 @ 10.0 ft., SM

NOTE: Seepage just below topsoil.

TP 09, E of Dam, 5/17/71, NM, 1353.4

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, sandy
 Max. size 20", varied lithology;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 40% sand, 20% non-plastic fines);
 Brown; moist-wet; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Light seepage just below topsoil.

TP 0101, Borrow, 5/17/71, NM, 1357.3

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, silty
 Max. size 36", shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Seepage just below topsoil; approx. 1% of ground surface in borrow area is covered with sandstone boulders

TP 002, Borrow, 5/18/71, NM, 1347.1

0.0 - 1.0 Topsoil
 1.0 - 14.0 Gravel, silty
 Max. size 24", shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Moderate seepage @ 9.0 ft.; bank caves occasionally.

TP 0105, Borrow, 5/18/71, NM, 1344.8

0.0 - 1.0 Topsoil
 1.0 - 15.0 Gravel, silty
 Max. size 24", varied w/shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: TP 0104 was not dug.

TP 0105, Borrow, 5/18/71, NM, 1342.3

0.0 - 1.0 Topsoil
 1.0 - 15.5 Gravel, silty
 Max. size 30", varied lithology;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)
 D. S. 105.1 @ 10.0 ft., SM

NOTE: Seepage just below topsoil

TP 0106, borrow, 5/18/71, NM, 1352.5

0.0 - 1.0 Topsoil
 1.0 - 14.5 Gravel, silty
 Max. size 30", shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 25% sand, 35% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

TP 0107, Borrow, 5/18/71, NM, 1352.1

0.0 - 1.0 Topsoil
 1.0 - 13.0 Gravel, silty
 Max. size 24", shale flags and sandstone boulders;
 Approx. 20 + 6", 20 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)
 D. S. 107.1 @ 10.0 ft., SM

NOTE: Seepage @ 3.0 ft.; refusal on boulders @ 13.0 ft.

TP 0201, Borrow, Spwy., 6/22/71, NM, 1351.2

0.0 - 1.0 Topsoil
 1.0 - 12.0 Sand, silty
 Max. size 18", varied lithology w/sandstone boulders and shale flags;
 Approx. 10 + 6", 20 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)
 D. S. 201.1 @ 8.0 ft.

NOTE: Refusal on boulders @ 12.0 ft.

TP 0202, B

0.0 - 1.0
 1.0 - 1.0

TP 0301, P1

0.0 - 1.0
 1.0 - 11

TP 0302, P2

0.0 - 1.0
 1.0 - 13

TP 0401, Q1

0.0 - 1.0
 1.0 - 7

TP 0402, Q2

0.0 - 1.0
 1.0 - 5

TP 0501, Dr

0.0 - 1.0
 1.0 - 12

TP 0502, Dr

0.0 - 1.0
 1.0 - 13

1

TP #9, E of Rm, 5/17/71, NM, 1353.0

0.0 - 1.0 Topsoil
1.0 - 15.0 Gravel, silty
Max. size 30", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Light seepage just below topsoil.

TP #101, Borrow, 5/17/71, NM, 1357.3

0.0 - 1.0 Topsoil
1.0 - 15.0 Gravel, silty
Max. size 30", shale flags and sandstone boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Seepage just below topsoil; approx. 10 of
ground surface in borrow area is covered with
sandstone boulders

TP #82, Borrow, 5/18/71, NM, 1347.1

0.0 - 1.0 Topsoil
1.0 - 14.0 Gravel, silty
Max. size 30", shale flags and sandstone boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Moderate seepage @ 9.0 ft.; bank caves occa-
sionally.

TP #103, Borrow, 5/18/71, NM, 1344.8

0.0 - 1.0 Topsoil
1.0 - 15.0 Gravel, silty
Max. size 24", varied w/shale flags and sandstone
boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: TP #104 was not dug.

TP #105, Borrow, 5/18/71, NM, 1342.3

0.0 - 1.0 Topsoil
1.0 - 15.5 Gravel, silty
Max. size 30", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
D.S. 105.1 @ 10.0 ft. SM
NOTE: Seepage just below topsoil

TP #106, Borrow, 5/18/71, NM, 1352.5

0.0 - 1.0 Topsoil
1.0 - 14.5 Gravel, silty
Max. size 30", shale flags and sandstone boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)

TP #107, Borrow, 5/18/71, NM, 1352.1

0.0 - 1.0 Topsoil
1.0 - 13.0 Gravel, silty
Max. size 24", shale flags and sandstone boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
D.S. 107.1 @ 10.0 ft. SM
NOTE: Seepage @ 3.0 ft.; refusal on boulders
@ 15.0 ft.

TP #201, Borrow, 5/22/71, NM, 1351.2

0.0 - 1.0 Topsoil
1.0 - 12.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders
and shale flags;
Approx. 15% 4", 25% 3-6", 97% matrix (which is approx.
25% gravel, 35% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
D.S. 201.1 @ 8.0 ft.
NOTE: Refusal on boulders @ 12.0 ft.

TP #202, Borrow, 5/22/71, NM, 1349.9

0.0 - 1.0 Topsoil
1.0 - 14.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders and
shale flags;
Approx. 15% 4", 25% 3-6", 97% matrix (which is approx.
25% gravel, 35% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Refusal on boulders @ 14.0 ft.

TP #301, Pym. Spwy., 5/18/71, NM, 1325.5

0.0 - 1.0 Topsoil
1.0 - 13.0 Gravel, silty
Max. size 24", shale flags and sandstone boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Heavy seepage through pocket in till @ 7.5 ft.; pit a-
bandoned @ 13.0 ft. due to water and caving banks.

TP #302, Pym. Spwy., 5/19/71, NM, 1313.0

0.0 - 1.0 Topsoil
1.0 - 13.0 Gravel, silty
Max. size 30", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Seepage from creek and just below topsoil material
very stony, but tight; refusal @ 13.0 ft. on
boulders or bedrock; unable to determine which one
due to water in pit.

TP #401, Outlet Channel, 5/19/71, NM, 1311.2

0.0 - 1.0 Topsoil
1.0 - 7.0 Gravel, silty
Max. size 30", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Seepage just below topsoil.

TP #402, Outlet Channel, 5/19/71, NM, 1309.3

0.0 - 1.0 Topsoil
1.0 - 5.0 Gravel, silty
Max. size 30", varied lithology w/shale flags and sandstone
boulders;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
NOTE: Seepage from creek.

TP #501, Drain, 5/17/71, NM, 1333.3

0.0 - 1.0 Topsoil
1.0 - 12.0 Gravel, silty
Max. size 24", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)

TP #502, Drain, 5/17/71, NM, 1325.6

0.0 - 1.0 Topsoil
1.0 - 13.0 Gravel, silty
Max. size 24", varied lithology;
Approx. 25% 4", 25% 3-6", 94% matrix (which is approx.
40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous;
glacial till; (GM)
D.S. 502.1 @ 8.0 ft. SM

AS BUILT

5.6-172 10/31/74

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&O PROJECT
CHENANGO COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

STATE CONS. ENGINEER

NY-2357-P

TP #343, Grain, 5/10/71, MW, 1326.9

0.0 - 1.0 Topsoil
 1.0 - 14.0 Gravel, silty
 Max. size 18". Varied lithology, w/shale flags and sandstone boulders;
 Approx. 16-6", 35 1-6", 600 matrix (which is approx. 15% gravel, 30% sand, 35% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (SM)

NOTE: Heavy seepage @ 6.0 ft.; Banks curve continuously'

TP #344, Grain, 5/10/71, MW, 1329.9

0.0 - 1.0 Topsoil
 1.0 - 14.0 Gravel, silty
 Max. size 24". Varied lithology, w/shale flags and sandstone boulders;
 Approx. 16-6", 35 1-6", 600 matrix (which is approx. 15% gravel, 30% sand, 35% non-plastic fines);
 Brown; moist; slight permeability; dense; homogeneous; glacial till; (SM)

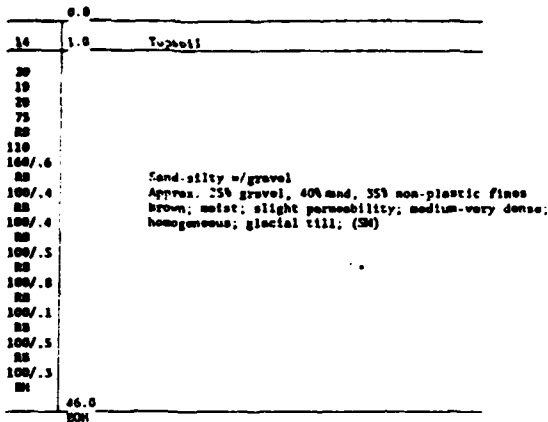
NOTE: Seepage just below topsoil; moderate seepage @ 9.0 ft.

CLARK CREEK

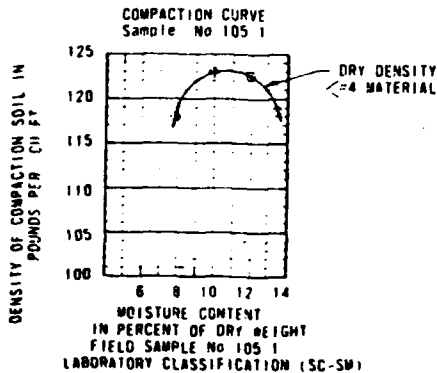
DRILL HOLE LOGS

BN #51, C of Dam, 6/7 - 6/8/71, MW, 1342.0

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NOTE: At 2.0 ft., 6/14/71; unable to sample below 35.3 ft. due to hole continually filling in with mat'l. from above, drilled hole to 46.0 ft. to verify no change in mat'l.



OFFICIAL LOGS

TEST HOLE NUMBERING SYSTEM

	Test Pit (TP)	Drill Hole (DH)
Centerline of Dam	1-00	51-00
Access Area	101-100	151-100
Emergency Spillway	201-200	251-200
Principal Spillway	301-300	351-300
Outlet Channel	401-400	451-400
Drain Line	501-500	551-500
Other	601-600	651-600

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOLS

GW	Well graded gravels; gravel-sand mixture
GP	Poorly graded gravels
GM	Silty gravels; gravel-sand-silt mixtures
GC	Clayey gravels; gravel-sand-clay mixtures
SM	Well graded sands; sand-gravel mixtures
SP	Poorly graded sands
SM	Silty sands; sand-silt mixtures
SC	Clayey sands; sand-clay mixtures
ML	Silts; silty, very fine sands; sandy or clayey silts
CL	Clays of low to medium plasticity; silty, sandy, or gravelly clays
OL	Organic silts and organic silty clays of low plasticity
MH	Elastic silts; micaceous or distaceous silts
CH	Clays of high plasticity, fat clays
OH	Organic silts or clays of medium to high plasticity
PT	Peat, muck

(xx) Unified Classification by Visual-Manual Procedure (ASTM D2488-66T) in the field.

xx Unified Classification based on laboratory analysis of representative samples (ASTM D2487-66T).

BACKSIDE PIT AND DRILL HOLE LOG TERMS AND ABBREVIATIONS

Sample types - DS - Disturbed sample (loose bagged, mixed)
- US - Undisturbed sample (sealed block or tube type)
Matrix - All material less than 3"
Atterberg limits - (ASTM D424-59) - LL - Liquid Limit
- PL - Plastic Limit
- PI - Plasticity Index

Bldr - Boulder
Cbl - Cobble
A - Angular
SA - Subangular
SR - Subrounded
R - Rounded
ss - Sandstone
sh - Shale
slst - Siltstone
ls - Limestone
sed - Sedimentary
WL - Water Level
S - Sump in test hole
BH - Blind hole - no sample
WHM - Height of Hammer
Ref - Refusal
MK - Rock core 2 1/8" diameter
RB - Reiller bit - no sample
AUG - Auger - no sample
DBS - Dry barrel sample
STS - Split tube sample
Rec - Recovery - % of rock or STS re-covered
k - Permeability rate (ft/day)
EOH - End of hole

I - Blows per foot - Standard Penetration Test (ASTM D1556)
MQD - Rock Quality Designation in 4' length of core pieces > 4' length of core run

KEY TO BACKSIDE PIT LOGS

TP Number, Location, Date, Logged by, Elevation

Depth Typical
Maximum size - Lithology
Approx. 1'-6", 15'-6", Matrix (which is approx.
1/4 gravel, 1/4 sand, 1/4 plasticity fines)
odor, color, moisture; permeability; density or consistency; structure, origin; (field USCS)
Sample number and type: lab USCS

NOTE:

KEY TO DRILL HOLE LOGS

DH Number, Location, Date, Logged by, Elevation

N	Description of Geologic Horizon	Depth
	0.0	Depth
	Typical name; gradation; Est. % gravel, % sand, % fines; plasticity; odor, color, moisture; permeability; density or consistency; structure; origin; (field USCS). Sample number and type: lab USCS	
	6.0	Depth

NOTE:

AS BUILT

01/31/74
C.C.-177

CLARKS CREEK WATERSHED PROJECT
SITE 1

SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

STATE CONS ENGINEER

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